

**Coordinates of Control:  
Indigenous Peoples and Knowledges in Bioprospecting Rhetoric**

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## **Coordinates of Control:**

### **Indigenous Peoples and Knowledges in Bioprospecting Rhetoric**

**Chikako Takeshita**

**(Abstract)**

In this thesis, I draw attention to how representations of indigenous peoples and knowledges in the rhetoric of bioprospecting weave the people into multiple coordinates of discursive control. Bioprospecting, or the exploration of biological resources in search of valuable genetic and chemical material for commercial use, is portrayed by proponents as an ideal project which benefit all of its stakeholders. I challenge such perception by exposing the power relationships underlying bioprospecting proposals as well as the various interests built into their rhetoric. My particular interest lies in exploring the implications for indigenous peoples whose appearances in bioprospecting proposals are less than voluntary. I make three claims: (1) that the representation of indigenous peoples as *stewards* of the environment is a role assigned to them, which is then circulated and mobilized within the bioprospecting rhetoric in order to support its arguments concerning biodiversity conservation; (2) that indigenous knowledges of the environment, of medicinal plants in particular, are taken out of their original socio-cultural contexts, utilized, appropriated, and valorized by bioprospectors who construct the rhetoric; (3) that the visibility of indigenous peoples and knowledges, which was heightened as a result of the increased interest taken in controlling them, opens up new opportunities for the people to resist misappropriation and struggle for self-definition. In short, this project takes indigenous peoples and knowledges as the intersection of forces and interests comprising an intricate web of power relationships, within which any participant can attempt to empower oneself either by resisting or manipulating the control to which one is exposed.

## Acknowledgements

Some time ago, Bill O'Brien loaned me a book titled *Biopiracy: The Plunder of Nature and Knowledge* by Vandana Shiva. I noted that the author criticized bioprospecting as *biopiracy* or the stealing of resources and knowledges that belong to indigenous peoples and profiting from them through commercialization. But what intrigued me the most about bioprospecting was the idea of utilizing a shaman's knowledge of medicinal plants for the development of new modern drugs. Thus, I initially conceived this project to be about the scientization of indigenous or cultural knowledge. This theme remains in this work. However, instead of analyzing the process of scientization or comparing indigenous to scientific knowledges, I turned to exploring the power relationships behind the discourse in which indigenous knowledge is transformed into scientific knowledge. Therefore, my research centers around the ways in which the rhetoric of bioprospecting portrays indigenous peoples and what kind of discursive controls are consequently exercised over these peoples.

Dr. John Browder made me aware of the work of Dr. David Kingston, who kindly shared his experiences with the Suriname bioprospecting project of the International Cooperative Biodiversity Group (ICBG), of which he is the leader. What I learned from the one hour interview with Dr. Kingston led to some important ideas for this thesis. I am indebted to Tim Luke for introducing the work of Arturo Escobar, which played a crucial role in tying together the issues I wished to address.

I would like to express my greatest appreciation to my committee members, Timothy W. Luke (chair), Richard M. Burian, William O'Brien, and Eileen Christ. I have no doubt that this thesis crystalized through their thought-provoking questions that inspired me to continue exploring this subject. I feel very fortunate to have had Tim Luke's concise and direct advice along with Dick Burian's thorough and thoughtful feedback that allowed me to improve this work. I wish to thank Bill O'Brien for readily coming on board, on short notice, and for his constructive and considerate comments.

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## Table of Contents

<b>ACKNOWLEDGEMENTS.....</b>	<b>III</b>
<b>INTRODUCTION.....</b>	<b>1</b>
<b>CHAPTER ONE: THE DYNAMICS OF THE BIOPROSPECTING RHETORIC.....</b>	<b>6</b>
1.0 INTRODUCTION.....	6
1.1 THE “WIN-WIN-WIN” RHETORIC AND THE DOMINANT DISCOURSES.....	7
1.2 MULTIPLE STAKEHOLDERS: COLLABORATION IN DISGUISE.....	12
1.3 <i>BIOPIRACY</i> AND THE ROLE OF THE CONVENTION ON BIOLOGICAL DIVERSITY.....	15
1.4 THE RHETORIC OF EQUITABILITY AND COMPENSATION.....	19
1.5 CONCLUSION: THE DYNAMICS OF BIOPROSPECTING RHETORIC.....	25
<b>CHAPTER TWO: INDIGENOUS PEOPLE AS <i>STEWARDS</i> OF BIODIVERSITY.....</b>	<b>27</b>
2.0 INTRODUCTION.....	27
2.1 EQUITY, CONSERVATION, AND COMPENSATION.....	30
2.2 STEWARDSHIP AND THE ECOLOGICAL FORM OF CAPITAL.....	33
2.3 INDIGENOUS PEOPLE AND THEIR REGIME OF REPRESENTATION.....	35
2.4 CONCLUSION: THE APPROPRIATION OF INDIGENOUS <i>STEWARDS</i> .....	42
<b>CHAPTER THREE: THE RHETORIC OF INDIGENOUS KNOWLEDGE OF MEDICINAL PLANTS.....</b>	<b>44</b>
3.0 INTRODUCTION.....	44
3.1 KNOWLEDGE OF MEDICINAL PLANTS IN TRADITIONAL SETTINGS.....	46
3.2 ETHNOBOTANISTS’ RHETORIC OF TRADITIONAL MEDICINE.....	49
3.3 THE RHETORIC OF THE VALUE OF INDIGENOUS KNOWLEDGE.....	57
3.4 CONCLUSION: THE SEMIOTIC CONQUEST OF INDIGENOUS KNOWLEDGE.....	62
<b>CHAPTER FOUR: SEMIOTIC RESISTANCES OF INDIGENOUS PEOPLES.....</b>	<b>65</b>
4.0 INTRODUCTION.....	65
4.1 THE AYAHUASCA CONTROVERSY: AN EXPLICIT SEMIOTIC RESISTANCE.....	66
4.2 THE PENAN PROTEST: ENVIRONMENTAL RHETORIC AND INDIGENOUS KNOWLEDGE.....	67
4.3 THE TIRÍOS: INDIGENOUS KNOWLEDGE AND CULTURAL IDENTITY.....	69
4.4 THE SAMOAN EFFORTS: MATERIAL AND SEMIOTIC EMPOWERMENT.....	70
4.5 CONCLUSION: LOCAL EMPOWERMENT, SEMIOTIC RESISTANCE, AND DISCURSIVE RESISTANCE.....	73
<b>CONCLUSION.....</b>	<b>75</b>
<b>REFERENCES.....</b>	<b>77</b>

## **Introduction**

Biodiversity prospecting, or “the exploration of biological resources in search of active compounds for pharmaceutical development, agriculture, and industry” (Feinsilver 1996: 116) has captured the attention of many, including scientists, businessmen, environmentalists, policy makers, and human rights advocates. Pharmaceutical bioprospecting is portrayed by its proponents as a “win-win-win” project, which simultaneously realizes improved health care for the human race, economic development in natural-resource-rich countries, and conservation of biodiversity. For example, the International Cooperative Biodiversity Group (ICBG) defines their objective as follows:

ICBG was designed to stimulate the field of bioprospecting, to provide models for the development of sustainable use of biodiversity, and to gather evidence on the feasibility of bioprospecting as a means to:

1. improve human health through discovery of natural products with medicinal properties
2. conserve biodiversity through valuation of natural resources, training and infrastructure building to aid in management
3. promote sustainable economic activity of communities, primarily in less developed countries in which much of the world’s biodiversity is found (Rosenthal 1996).

Achieving each of the three goals is mutually dependent. Health care will be improved owing to the drugs that will be discovered through the scientific studies of biological materials. Such materials are collected in biodiverse regions most commonly found in tropical forests of developing countries. Bioprospecting activities can generate economic activities that will benefit the source countries in which biodiversity resides because long- and short-term compensations for granting access to their natural resources to scientists and businessmen of industrialized countries will be offered to these nations. As a result of the value found in preserving natural resources, there undoubtedly will be more efforts towards biodiversity conservation. All of these trends indicate the significance of bioprospecting as a mode of technological innovation and economic

development, and it is this significance that warrants to critical analysis of its theory and practice.

This thesis was conceived when I asked two simple questions about bioprospecting: (1) Is this “win-win-win” proposition merely rhetoric? If so, who really benefits?; and (2) What are the implications for indigenous people who live in biodiverse regions and are sometimes referred to in bioprospecting proposals as important to the project? Bioprospecting proposals occasionally depict indigenous people as important to their projects because the people have valuable medicinal knowledge for the drug discovery endeavor and because as local inhabitants they hold the key to the preservation of biodiversity. I suspected from the very beginning that, although in theory the indigenous people are to benefit from bioprospecting projects, it is more likely that they are vulnerable to various kinds of manipulation and intervention by more powerful stakeholders.<sup>1</sup>

I have had a long-standing interest in the works of ethnobotanists who study indigenous knowledge of shamans in an effort to discover medicinal plants that can be developed into modern drugs. I developed an insight from reading their works that many of them take genuine interest for proving the efficacy of indigenous people’s medicinal knowledge and preserving their culture and natural habitat.<sup>2</sup> But I also felt that when indigenous knowledge is utilized in scientific studies, its meaning and value in the original socio-cultural context is lost or ignored. In addition, I became aware that the collection of indigenous plants and knowledges is regarded by some as a new form of colonialism or *biopiracy* (Shiva 1997). Finally, I was intrigued by a comment made by Arturo Escobar about local knowledges, which I quote below in full:

This new capitalization of nature does not only rely on the semiotic conquest of territories (in terms of biodiversity reserves and new schemes for ownership and control) and communities (as “stewards” of nature); it also requires the semiotic conquest of local knowledges, to the extent that “saving nature” demands the valuation of local knowledges of sustaining nature.

Modern biology is beginning to find local knowledge systems to be useful

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<sup>1</sup> Shiva (1997) in particular gave me the idea to question the negative aspects of bioprospecting.

complements. In these discourses, however, knowledge is seen as something that exists in the “minds” of individual persons (shamans, sages, elders) about external “objects” (plants, species), the medical or economic “utility” of which their bearers are supposed to “transmit” to the modern experts. Local knowledge is not seen as a complex cultural construction, involving not objects but movements and events that are profoundly historical and relational (Escobar 1995: 204).

Without having fully digested it, I started to contemplate the meaning of the above statement. This paragraph provided me with valuable insights into the problem. In fact, it turned out that “the semiotic conquest of nature, people, and knowledge” became an important concept that ties this thesis together.

My encounters with documents and perspectives mentioned above led me to investigate the complex power relationships that are built into the rhetoric of bioprospecting. The main objective of this thesis is to challenge the view that indigenous populations benefit equitably from bioprospecting projects and to demonstrate that unequal power relationships are already built in the bioprospecting rhetoric, which appropriates “indigenous peoples and knowledges” in various ways that meet the interests of multiple stakeholders. Put another way, indigenous people are involuntarily woven into a web of multiple coordinates of control by the rhetoric of bioprospecting. While granting that material conditions are also important in discussing the oppression experienced by many of the local inhabitants of developing countries, my emphasis is on the ways in which oppression is mediated by discourse. I focus on the semiotic and discursive controls over indigenous peoples because discourses are powerful tools of control, the implications of which for indigenous people may be less obvious than material subordination, but yet are extremely significant,

I make a few key assumptions in this work. First, I side with Escobar in assuming that local knowledge should be seen as a complex cultural construction rather than as matter-of-fact information that is transferable from one expert to another. I believe that in order

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<sup>2</sup> Some of the works which led me to selecting my thesis topic include: Balick and Cox (1996), Cox (1991), Cunningham (1991), King (1991), Plotkin (1993), and Reid, et al. (1993).

to do justice to the true value of indigenous knowledge, the original context within which the knowledge was developed and utilized should be privileged. At the very least, it must be recognized that it has an original context within which it can be understood and valorized.

The second important assumption I make is about the power of discourse. I follow many scholars inspired by the works of Michel Foucault in regarding discourse as a creator of social reality; it defines the ways in which reality can be conceptualized.<sup>3</sup> Discourse is both a symptom (a reflection of the outside world) and an apparatus (to control the reality). In other words, where some players have more power than others, their power relationships are already built into the dominant discourse. A discourse becomes an apparatus of control when one group uses it to its advantage to construct identities of and define realities for others.<sup>4</sup> A power elite can enhance its power by making use of the discursive power of the rhetoric that it controls. Meanwhile, the clients of the discourse are woven into various coordinates of control, which correspond to the interests of multiple stakeholders who wield the rhetoric.

I treat discourse and rhetoric that mediate power and control as if they have their own agencies. Those who deploy a discourse may or may not be conscious of the effect of discursive power upon its subjects. Nevertheless, power is exercised through that discourse inside which the power structure is already built. In such case, discourse functions as if it has its own agency.

I do not regard power as necessarily flowing from top to bottom hierarchically. Power is caught up in an intricate web of forces and interests, in which all participants can attempt to empower themselves by resisting or manipulating the control that one is exposed to.<sup>5</sup> I take a discursive approach to bioprospecting because discourse analysis allows the analyst to detach him/herself from the familiarity of the rhetoric and assess its

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<sup>3</sup> Foucault (1972, 1979).

<sup>4</sup> Escobar (1995) discusses extensively on the how the development discourse defined identities for peasants, women, and the environment, and practiced interventions upon them accordingly. For instance, the integrated rural development (IRD) rhetoric defined peasants as potential producers for the market and tried to convert them to cash crop producers rather than subsistence farmers. The Women in Development (WID) discourse subjected Third World women to various economic development projects, which often did not take into consideration their values and roles within their society and culture. Escobar argues that constructed identities, or what he calls regime of representations, are an apparatus of discursive control.

<sup>5</sup> Foucault (1979) analyzes power as being exercised at the capillary level, rather than hierarchical.

theoretical and practical contexts (Foucault 1972, 1979). In short, I treat the rhetoric of bioprospecting as a space in which various concepts and identities are produced and utilized and where diverse forms of activities and interventions take place.

The work is organized into four chapters. The first three chapters analyze the discursive powers that subjugate indigenous peoples. Chapter one focuses on how the rhetoric of bioprospecting is constructed in general: how it builds upon the dominant discourse to justify its arguments, how it incorporates the interests of multiple stakeholders, and how prevailing power relationships are maintained through the rhetoric. The second and third chapters demonstrate how bioprospecting rhetoric depicts, appropriates, circulates, valorizes, and mobilizes indigenous peoples and their knowledges. In chapter two, I examine how the representation of indigenous people in the rhetoric of *stewardship*, central to the dominant discourse of bioprospecting, deploys them in roles that are not self-defined, but imposed. In chapter three, I investigate how pharmaceutical bioprospecting raises the visibility of indigenous knowledge of medicinal plants and subsequently rhetorically lowers its value.

The fourth chapter presents the subject in a more positive light. Bioprospecting has raised the profile of indigenous peoples and their knowledges, which in turn opened up new spaces for them to struggle for empowerment. I argue that in order for indigenous peoples to resist being involuntarily woven into coordinates of discursive control, they need to develop an alternative regime of representation that can counteract the forced identities constructed by the dominant discourse. In this final chapter, I present examples of local resistances by several different indigenous tribes, which are both very symbolic and material in their method and intent.

## Chapter One: The Dynamics of the Bioprospecting Rhetoric

### 1.0 Introduction

This chapter centers around two main concerns: (1) how is bioprospecting rhetoric constructed? What are the sources of its arguments and how do the stakeholders interests figure into the rhetoric? And (2) what kind of power relationships surround bioprospecting particularly between bioprospectors and source countries? I also provide a background for subsequent chapters by introducing some of the major bioprospecting projects such as the Merck/INBio agreement and the International Cooperative Biodiversity Group (ICBG) as well as the Convention on Biological Diversity (CBD), which is an international declaration that affects the language of the rhetoric.

The chapter is divided into four parts. First, I analyze how the “win-win-win” rhetoric of bioprospecting holds together by borrowing arguments from dominant discourses such as development, sustainable development, and biodiversity conservation. I point out that various assumptions embedded in those discourses also become underlying assumptions for bioprospecting proposals. My intention is to illuminate the power relationships behind the discourses. Secondly, I examine what multiple stakeholders expect from bioprospecting projects and how their interests may figure into or be reflected in the rhetoric. I will show that the best way to view what is promoted as *collaboration* among multiple partners is as a project that joins together various interests and makes all the objectives pursuable through articulating the interests as *common*. Thirdly, I explore the role of the CBD. The CBD is often viewed to have empowered the source countries by officially acknowledging sovereignty rights over biological resources. My analysis shows that the CBD can also be used to create new obligations for nations with biodiversity. Lastly, I examine the rhetoric of equitability and how power relationships embedded in the rhetoric materialize in the forms of compensations offered to source country partners. What I hope to accomplish in this chapter is not so much to completely deny the “win-win-win” proposition, but to expose the underlying power relationships that subjugates source country partners and to challenge the tone of the rhetoric that disguises inequity by emphasizing “equitability” and “fairness.”

### 1.1 The “Win-win-win” Rhetoric and the Dominant Discourses

Bioprospecting proposals maintain that they pursue and achieve a three-tiered goal. The goals are claimed to be *interdependent*. Referring to the workshop which established the basis for ICBG, Schweitzer, et al. (1991) wrote:

The results of the meeting will provide the basis for future *collaboration* among the three sponsoring agencies to address the *interdependent* issues of conservation, economic growth, and human health in terms of drug discovery for cancer, AIDS, and other diseases of the developed countries as well as diseases of primary concern to the developing countries<sup>6</sup> (1294, emphasis added).

The interdependency among the three goals can be described plainly as follows: (1) drug discovery from natural resources depends on the access to biodiversity now and in the future; (2) access to biodiversity is dependent on conservation, which require incentives and must be affordable; (3) funds for conservation may be derived from investment made on drug discovery projects and from profits earned by developed drugs – in other words, from economic growth generated by bioprospecting activities.

The bioprospecting agreement made in 1991 between the pharmaceutical giant, Merck Sharp and Dohme, and the Cost Rican conservation organization, INBio, is often referred to as a watershed case that reified the ties among the three goals (Reid, et al. 1993: 2). Merck Sharp and Dohme, entered the contract with the objective of running a drug-screening program on natural resources obtained from INBio to look for potentially valuable chemical compounds. In return for the chemical extracts from wild plants, insects, and micro-organisms that it provided to Merck, INBio received compensations worth over US\$ 1 million and was promised royalties should a new drug be developed. What is considered as a particularly important step to combining bioprospecting with conservation efforts is that INBio agreed to contribute 10 percent of the budget and 50 percent of any royalties for the conservation of national parks in Costa Rica (Reid, et al. 1993).

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<sup>6</sup> ICBG was initiated by the United States Agency for International Development (USAID), National Institutes of Health (NIH), and National Science Foundation (NSF), whose organizational objectives are in line with the goals promoted by the bioprospecting rhetoric: USAID aims at fostering development, NIH to improve health care, and NSF to foster the study of biodiversity.

Walter Reid and his co-authors of the World Resource Institute describe the effect of the Merck/INBio bioprospecting project on biodiversity conservation as follows:

Perhaps the most important insight from INBio's experience is that biodiversity prospecting activities are only a means to an end. INBio was established to help identify and inventory Costa Rica's biodiversity and to integrate its non-destructive use into the intellectual and economic fabric of the society. Biodiversity prospecting helps fund conservation, but more important, it demonstrates the economic value of biodiversity and thus helps convince policy-makers that biodiversity conservation should figure centrally into all development planning (Reid, et al. 1993: 28).

“Non-destructive use of biodiversity,” “conservation,” “economic value of biodiversity,” and “development planning” are some of the core concepts that are borrowed from other discourses such development, sustainable development, and biodiversity conservation in order to construct arguments in bioprospecting proposals. As the analyses in subsequent sections will show, the various implications, presumptions, and norms that are embedded in the dominant discourses automatically become the underlying assumptions for the rhetoric of bioprospecting as well. This also implies that the prevailing power relationships built into the discourses are perpetuated in bioprospecting rhetoric.

#### *The discourse of sustainable development*

The notion of sustainable development moved its way into the mainstream discourse owing to the landmark Brundtland Report, formally titled “Our Common Future,” prepared by the World Commission of Environment and Development (WCED) in 1987. The idea that sustainable use of environmental resources will achieve both economic growth and environmental conservation drew international attention. The report attributes the main causes of environmental degradation to uneven development, poverty, and population growth in the less-developed countries, which account for the conditions that compel the people in these countries to overexploit their natural resources and put “unprecedented pressures on the planet's lands, waters, forests, and other natural resources” (WCED 1987: xii). The report maintains that “a world in which poverty is endemic will always be prone to ecological and other catastrophes” (WCED 1987: 8). It

suggests that what is required in order to relieve environmental pressure and for conservation to be affordable for less-developed countries is “a new era of economic growth – growth that is forceful and at the same time socially and environmentally sustainable” (WCED 1987: xii). These arguments find their supporters in many quarters, particularly in the business community and in governments of less-industrialized countries who appreciate the emphasis on economic growth and development.

Bioprospecting proposals map their agenda closely to the arguments supported by the discourse of sustainable development by claiming that bioprospecting activities will make biodiversity economically valuable and produce economic returns that will relieve the poverty that is currently a driving force towards environmental degradation. Proponents of sustainable development regard bioprospecting proposals favorably. As Supriatna and Guérin-McManus (1997) put it: “bioprospecting is important for conservation because it represents a part of the spectrum of economic activities in the rain forest that is not based on intensive resource extraction.”

The following statement in the Request for Application (RFA) for the ICBG project reflects the general conception that has taken root under the influence of the sustainable development discourse that the economic needs in the developing countries are what puts much pressure on the environment:

The underlying causes of biodiversity loss are many and complex, and involve interwoven social, economic, and political elements. It is clear, however, that poverty, unemployment, and lack of economic opportunities are significant contributing factors. In developing countries struggling to meet the most basic human needs, efforts to protect biological diversity will succeed only if implemented in the context of promoting sustainable economic growth (ICBG 1997).<sup>7</sup>

The solution to environmental degradation owing to ‘poverty’ provided by the sustainable development discourse, therefore, is economic growth. Bioprospecting proposals often stress the need to assist developing countries conserve biodiversity which contains economically valuable resources. For instance, Baker, et al. (1995) state: “it is

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<sup>7</sup> ICBG Request for Application. RFA TW-98-001, National Institutes of Health, Bethesda, MD, August 1997. <http://www.nih.gov/fic/opportunities/rfa.html>

clear that, without suitable economic, intellectual, and technological incentives for sustainable development, the genetically rich source countries and their communities will be unable to preserve these valuable resources for research into their beneficial uses for humankind” (1329).

One of the fundamental assumptions that goes unquestioned is that source countries need economic growth and development and that support from developed countries are appreciated. Bioprospecting proposals are welcomed because they not only provide a means to generate income without destroying the environment, but also because the projects may aid the “poor” countries develop. However, idea that “poverty” and the “necessity to develop” were not social realities until they were conceptualized. Arturo Escobar (1995) maintains that the problematization of poverty after World War II is what constructed the “underdeveloped” countries. Former colonizers took interest in vitalizing the economies of former colonies in order to expand their markets and stabilize political conditions of the world. They used the economic conception of poverty to define “poor countries” as lacking what wealthy countries have in terms of money and material possession, which necessitates that the solution to poverty be economic growth and development. The “poor” countries began to busy themselves embarking on the task of “un-underdeveloping” by subjecting themselves to all sorts of development interventions and allowing themselves to be measured by economic standards. Capitalist economics not only brought with it an entirely different mode of production and way of conceiving economic and social life to the so-called “underdeveloped” societies, but also extended to the rest of the world hierarchy based on economic capacity as well as disciplines and norms based on capitalist ideology (Escobar 1988). Wealthier countries now ensure their control under the protection of the power of the dominant development discourse.

The discourse of sustainable development basically is an extension of the argument for development, which extends the existing hierarchical relationships. Bioprospecting proposals, by building upon the discourses of development and sustainable development also assume the prevailing power structure. Without acknowledging that development assistance may indeed be a development intervention, bioprospecting proposals speak of “development” and financial or technical development

aid to be one of the preferred methods of compensating source countries for granting access to biological resources (Feinsilver 1996; Supriatna and Guérin-McManus 1997; Rosenthal 1996, 1997). Whether the party that deploys the rhetoric of bioprospecting is conscious or not, discourse mediates power relationships and control. In addition to promoting the sustainable use of natural resources and economic development as a cure for environmental conservation, the rhetoric of bioprospecting also imposes norms that are embedded in the dominant discourses. For instance, the discourse of sustainable development promotes the view that environmental problems are a global problem. Sometimes referred to as the *Spaceship Earth* metaphor, the idea views all people on earth as inhabitants of Planet Earth, who share equal responsibilities for protecting the environment. The earth's ecosystem is depicted as interconnected and fragile, requiring problems of deforestation, desertification, ozone depletion, climate change, and pollution to be managed transnationally as a 'global problem' on a planetary scale by all people on earth. As a result, the sustainable development imposes a norm, which obliges all those living on earth to take responsibility in global management of the environment (Sachs 1988). Bioprospecting proposals transmit the expectation that source country governments fulfil their responsibility to facilitate access to the nation's biodiversity for utilitarian purposes with international support (Supriatna and Guerin-McManus 1997).

In addition, the Brundland report claims that "sustainable development can be secured only through international co-operation and agreed regimes for surveillance, development, and management in the common interest" (WCED 1987: 261). Critics maintain that the appeal for "surveillance and management in the common interest" becomes another technique for the more powerful countries to mobilize control over global environmental resources (Escobar 1995; Sachs 1988; Shiva 1993; Visvanathan 1991). Global environmental management implies that industrialized countries with their economic, scientific, and technical resources assume leadership. Historian Michael Adas, in his book *Machine as Measure of Men* demonstrate that the colonizer's ability to manage nature and its resources using superior technology was often invoked to legitimize their ruling over the colonies.<sup>8</sup> The idea that

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<sup>8</sup> Adas (1989) writes:

“western” countries should oversee the environmental problems of the “non-western” countries with their scientific and technological capabilities, reminiscent of the civilizing-mission ideology held during the colonization period, remains in the dominant rhetoric.

### 1.2 Multiple Stakeholders: Collaboration in Disguise

There is a wide range of stakeholders in pharmaceutical bioprospecting from research institutions, for-profit pharmaceutical companies, botanical gardens, and conservation NGOs, to source country governments and local people. Each party brings different expectations and expertise to the projects.

Chemists and drug developers in research institutions harbor expectations on discovering new agents from natural sources with potential biomedical use. The U.S. National Cancer Institute (NCI), for instance, has been screening natural products since 1960 for chemical compounds to help combat cancer. The most significant success of the NCI drug-screening program is a drug extracted from the bark of the Pacific Yew tree, Taxol, which became a major breakthrough in the treatment of ovarian cancer. Although the dominant method of drug development method has been chemical synthesis for the past several decades, phenomenal advancements in biotechnology has made screening techniques so efficient that pursuing the search for novel bioactive compounds in plants, animals, and microorganisms has now become a realistic endeavor. Dr. David Kingston of Virginia Polytechnic Institute and State University, a chemist and the project leader of the Suriname ICBG, points out that the major advantage of natural products approach to drug discovery is its capability to providing complex molecules that would not be accessible by other routes. Plants, in particular, are an important source of novel compounds since they have evolved complex chemical defense systems to combat predators while being immobile (Kingston, et al., in press). Dr. Gordon Cragg, Chief of the US NCI’s Natural Products Branch expresses his anticipatory views as: “no chemist

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From early in the nineteenth century the notion that it was the Europeans’ destiny and duty to develop the resources of the globe was included in the mixture of humanitarian sentiment, cultural arrogance, and self-serving rationalization that advocates of imperial expansion blended into the civilizing-mission ideology... In addition to building cities and public works, Virey (in 1826) foretold, the Europeans would apply their “ingenious [industrial] arts” and techniques of exploiting natural resources in order to increase the wealth and well-being of the colonized peoples. (220)

can ‘dream up’ the complex bioactive molecules produced by nature, but once the natural lead compounds have been discovered, then the chemists can proceed with synthetic modifications to improve the natural lead” (cited in Feinsilver 1994: 116). From this drug developer’s perspective, biodiversity prospecting, therefore, is useful for combinatorial chemistry or “further development of natural leads, but even more importantly, for providing chemists with ideas that may form the basis of their computer-aided search for interesting chemical structures that may prove useful in drug development” (Feinsilver 1994).

Pharmaceutical companies present a slightly different position towards natural drug discovery from the commercial perspective. The preferred method of drug development remains chemical synthesis, so that the company does not have to be concerned about securing raw material for the drugs. Merck, for instance, emphasizes total synthesis of drugs once the therapeutic agent is discovered from natural products. SmithKline Beecham explains its strategy to secure raw material by working with biotechnology brokers who will negotiate contracting agreements with plant-source countries (Schweitzer, et al. 1991: 1295). Whereas pharmaceutical companies may dream of repeating the success of Taxol, it is also true that the chances are slim. In the last 25 years, Merck has found only five compounds from natural sources that have become marketable drugs either directly or with some chemical modification (Schweitzer 1991: 1295). The potential for one screened plant sample to develop into a drug, according to one calculation, is one in 250,000 (Feinsilver 1996).

While the enthusiasm of major pharmaceutical companies presents some uncertainty, other bioprospecting participants look upon commercial partners as potential source of funds. Botanical gardens, for instance, enter into agreements with industry to cover the cost of botanical or pharmacological research and help supplement their resources for conducting plant-related science (Laird 1993). Botanical gardens often play the role of an intermediary between commercial or research institutions and the providers of biological materials. They may also act as a research partner as well as distributor of compensation to local collaborators. Pharmaceutical companies, other than being a financial resource for bioprospecting projects, may also be expected to provide skill and

technology transfer as part of the benefits offered to source countries. Another source of funding may come from government agencies such as in the case of ICBG.

The source countries' stake in bioprospecting is to take advantage of their rich biological resources to attract foreign funds and gain access to new technologies. Source countries' circumstances vary, and therefore so do their needs. For instance, Indonesia has a fairly established traditional medicine industry. International cooperation may be useful in improving and standardizing quality control of traditional medicine for Indonesia (Supriatna and Guérin-McManus 1997). Madagascar's concern is to enhance their capability to process raw materials prior to exportation because of the low economic value of exporting raw material.<sup>9</sup> Thailand's needs seem to be "to explore the medicinal potential of the country's great variety of plants before they are lost to deforestation."<sup>10</sup> Whether their specific needs will be honored in bioprospecting projects is uncertain. Under most circumstances today, the implication of bioprospecting agreements for source countries is that they would receive some type of compensation for granting access to their natural resources. Generally, it is assumed that the source countries may receive an equitable share of monetary gains of natural product development as well as up-front compensation, participation in research, technology transfer, training, and education and other development support (Feinsilver 1994; Supriatana-Guérin-McManus 1997).

Conservation organizations such as INBio and NGOs such as Conservation International (CI) assume responsibility for conservation. CI considers its mission to be the conservation of genetic resources as well as traditional knowledge. It perceives its role in bioprospecting projects to be to "transform today's search for wild plants and organisms holding chemical and genetic building blocks for important new medicines and crops into a powerful conservation tool."<sup>11</sup> Ethnoscience, as I will elaborate in the next chapter, also play unique roles as advocates of local knowledges and biodiversity conservation.

The terms "interdependency" and "collaboration" are commonly seen in bioprospecting proposals. What is misleadingly inferred is that multiple partners

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<sup>9</sup> As expressed by a representative in the 1991 Workshop of Drug Discovery, Economic Development, and Biodiversity Conservation (Schweitzer et al, 1991).

<sup>10</sup> Ibid.

<sup>11</sup> Conservation International website: <http://www.ci.org>

collaborate because they have “common interests.” Rather, their interests are diverse as noted above. Bioprospecting rhetoric provides the illusion that they can all be accomplished by one proposal. All interested parties articulate their interest using the rhetoric so that their objectives appear compatible with the project goals. Certainly, achieving one objective may be dependent upon the collaboration of another party. Therefore, a contract or mutual agreement is required to bind “collaborating” parties to agreed responsibilities. In the meantime, each partner struggles to accomplish its objective while giving up as little as possible. The prevailing power relationships must be kept in perspective when examining what is offered by whom to whom in order to critically evaluate whether the agreements are fair deals. “Collaboration” and “mutuality” are convenient terms to disguise the bargaining that takes place behind the rhetoric of bioprospecting.

### 1.3 Biopiracy and the Role of the Convention on Biological Diversity

Since its signing at the Rio Summit in 1992, the Convention on Biological Diversity has become a common point of reference that gives bioprospecting agreements a general framework. The convention promotes objectives that correspond to the three goals of bioprospecting, phrased as “the conservation of biodiversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies” (CBD, Article 1). The convention also made official that nation-states have sovereign rights to their biological/genetic resources.<sup>12</sup> The CBD is believed to have straightened out the international community’s view towards earth’s biological resources, which had been regarded as “common heritage” of humanity the access to which is free and unrestricted.

Before 1992, there were instances of over-harvesting of developing countries’ biological resources by researchers of industrialized countries. For instance, in the early

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<sup>12</sup> Article 15 of the Convention on Biological Diversity states: Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation (Article 15.1). Each Contracting party shall take legislative, administrative or policy measures...with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of

1980's, a bioprospecting mission in Kenya sponsored by the U.S. National Cancer Institute harvested the entire adult population of *Maytenus buchananni* to test for anticancer compound (Supriatna and Guérin-McManus 1997). It was also the case that the most of the profits derived from these natural resources went to the developed countries and not the source countries. Because it was considered “global commons,” the local people and the source country could not place any financial value on their natural resources. Thus, they had no incentives for preserving them either. To cite another example, Eli Lilly developed the anticancer drugs Vincristine and Vinblastine from a Madagascar endemic plant, the Madagascar Rosy Periwinkles. From the drugs, the company has generated revenue of \$100 million per year. Yet, because no benefits were experienced by the local people or the Madagascar government, there was “no reason whatsoever for Madagascar to preserve the Rosy Periwinkle” (Scholtz 1989: quoted by Cunningham 1991). The CBD is regarded as having influence on the developing countries' view of their biological resources now that they can declare sovereign rights over them.

The unhindered access to biological resources by bioprospectors has been described as “biopiracy” – exploitation of the natural resources and related knowledge of developing countries by powerful industrialized countries.<sup>13</sup> A typical accusation would be that pharmaceutical companies would elicit the help of traditional medical practitioners from indigenous communities in the southern hemisphere to find plants with medicinal value, use their knowledge to develop a profitable drug, and leave the indigenous community with no share of the profit. Vandana Shiva, the author of *Biopiracy: The Plunder of Nature and Knowledge*, refers to the case of the neem tree. The neem tree is commonly known to Indians for its antibacterial and medicinal properties and the locals used it for toothbrush, medicine, biopesticides, in homes, fields, and common lands. Since the 1980's, at least three patents on neem have been taken out by Western companies. Critics express their discontent that not only do the Indians receive no share of the profit, but the neem products are being sold back to them (Shiva 1997).

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genetic resources with the Contracting Party providing such resources. Such sharing shall be upon mutually agreed terms (Article 15.7).

Proponents of bioprospecting often regard the Convention on Biological Diversity as the pivotal point where the dark past of “biopiracy” and environmental degradation turned into a bright future of benefits sharing and biodiversity conservation. The Convention is perceived to have enhanced incentives for conserving biological diversity as a competitive advantage that developing countries possess (Feinsilver 1996). A generally optimistic view that benefits would flow back to source countries is expressed as follows:

Fortunately, the times and attitudes are changing, and many organizations and companies, as well as governments, have become more enlightened and responsible citizens of the world community. Few members of corporate management, at least in the pharmaceutical industry, would disagree with the fundamental concept of a nation’s sovereignty over its own natural resources. The acquisition of biological samples for investigation is frequently viewed in the same way as the acquisition of any other commodity; some form of significant compensation is required (Baker, et al. 1995: 1331).

Source countries may indeed perceive this as an opportunity to attract foreign organizations and negotiate reciprocity from the utilization of the nations’ biological resources. However, critics such as Rural Advancement Foundation International (RAFI) and Genetic Resources Action International (GRAINS), are wary that since the power imbalance between the industrialized countries who seek access to biodiversity and the developing countries who own natural resources remains unchanged, the result of the agreement may easily turn out to be exploitative.<sup>14</sup>

Most recently, RAFI reported that the Council of Indigenous Traditional Midwives and Healers of Chiapas in Mexico is demanding that the ICBG project in Chiapas led by the University of Georgia to be suspended because it violates indigenous

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<sup>13</sup> Shiva (1997) is especially critical in this aspect. See below for reference to RAFI and GRAINS.

<sup>14</sup> RAFI and GRAINS both have websites which they use to promote their opinions.

RAFI: <http://www.rafi.org>

GRAINS: <http://www.grain.org/index.htm>

See articles: Janet Bell (1996) “Biopiracy’s Latest Disguise” *Seedling*, GRAINS article.

<http://www.grain.org/publications/seedling.htm>

Bioprospecting/Biopiracy and Indigenous Peoples’ RAFI article re-posted on the following website:

<http://www.latinsynergy.org/bioprospecting.htm>

people's rights, including those addressed by the CBD Article 8(j).<sup>15</sup> The news article titled *Biopiracy Project in Chiapas, Mexico Denounced by Mayan Indigenous Groups: University of Georgia Refuses to Halt Project*, RAFI reported that the council, which is composed of eleven Mayan organizations, denounced the bioprospecting project and asked other indigenous people in Chiapas to refuse to cooperate with the researchers. The council asserted that the project "is plundering our knowledge and taking plant samples from the communities in Chiapas, returning almost nothing in exchange" (RAFI 1999). The same article suggested that bioprospecting contracts can be viewed as legal biopiracy from the host country's perspective.

Although the Convention articulates several over-arching principles and gives a broad mandate over bioprospecting activities, it does not set out any specific standards or regulations of bioprospecting. While the Convention is viewed as a device for ensuring equitability among bioprospecting partners, it leaves questions such as "what is equitable?" and "how is equitability ensured?" to be dealt with in individual agreements. Furthermore, the rhetoric of the Convention can also be used to stress the responsibilities of the source countries rather than focusing on the obligations of the bioprospectors. Article 15.2 of the Convention mandates that "each Contracting Party shall endeavor to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not to impose restrictions that run counter to the objective of this Convention" (CBD 1992: Article 15.2). Source countries are now expected to facilitate access to biodiversity for the purpose of sustainable use and development of biological resources by setting up legislative procedures and to make national efforts to study and conserve its biodiversity. In a report prepared for the Indonesian government, the authors express their expectations as follows:

The Convention formally recognized the central principle that individual nations have sovereign rights to their biological resources and acknowledged that biodiversity can no longer be legally considered and treated as the 'common heritage' of humankind. The Convention *commits* genetically-rich countries to facilitating access to genetic resources for environmentally sound

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<sup>15</sup> *Biopiracy Project in Chiapas, Mexico Denounced by Mayan Indigenous Groups: University of Georgia Refuses to Halt Project*, News Release, 1 December 1999. Rural Advancement Foundation International.

uses in exchange for the sharing of the benefits derived from their use.

Execution of this *responsibility* is subject to national legislation (Supriatna and Guerin-McManus 1997, emphasis added).

Industrialized countries may see this as an opportunity to intervene in the source countries' affairs of setting up legislative procedures, developing sustainable use of biological resources, and investing in conservation programs with their authorities in science, technology, policy, education, legal matters, and environmental problems. The Convention on Biological Diversity has an appearance that empowers source countries and ensure equity among bioprospecting partners. In fact, it adds to the complexity of power relationships by providing another framework for enforcing new form of control.

#### 1.4 The Rhetoric of Equitability and Compensation

Responding to the accusation of biopiracy in part, bioprospecting proposals stress the importance of and commitment to equitable benefit sharing and fair compensation to all who take part in bioprospecting and conservation efforts. “An underlying tenet of the Convention on Biological Diversity,” states Reid, “is the fair and equitable distribution of the benefits of the use of genetic resources among *all* those who invest in their continued existence” (Reid, et al. 1993). The guideline developed in the Workshop on Drug Development, Biological Diversity, and Economic Growth reads: “Equal partnership, cooperation, and fair compensation are the principles which should guide all multinational efforts to maintain and use sustainably biodiversity and traditional knowledge” (Schweitzer 1991). However, how equitability is to be accomplished is not at all clear. Bioprospecting partners' attitudes toward equitability and compensation vary, but seem to be consistent in that the compensations they offer tend to be self-serving, if not indifferent.

Pharmaceutical companies and research institutions seem to agree on most of their policies towards research involving natural resources.<sup>16</sup> They recognize sovereignty

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[www.rafi.org](http://www.rafi.org)

<sup>16</sup> I used the examples in Baker, et al (1995) to compare policies or guideline statements. The article lists as examples, policy or guideline statements for natural product research for NCI, ICBG, University of Illinois at Chicago, University of Mississippi Research Institute of Pharmaceutical Sciences and pharmaceutical companies Bristol-Myers Squibb Company, Glaxo Group of Companies, Merck & Co. Inc., Shaman Pharmaceuticals, Inc., and SmithKline Beecham.

over biological resources and make sure that their collection activities are legal. Most acknowledge that when indigenous knowledge is sought, the informers must be informed of the nature of the project and have agreed to it, and that when commercial products are developed as a result of their cooperation, some royalties should flow back to the appropriate party. Some organizations explicitly state that this will be done through the help of a third party. Compensations to collaborating parties and benefits to source countries can be tailored according to the specific needs of each project, but may include up-front payment, training, technology transfer, and payment for samples. A few organizations makes commitments to consider utilizing the source country as the source of supplies of necessary raw material for any commercially developed product (Baker et al, 1995). In sum, the industrialized country organizations make sure that they abide by the regulatory requirements, acknowledge the principles of Convention on Biological Diversity, and show their interest in “collaboration”. Although bioprospectors from industrialized countries indicate that each agreement will be tailored to the collaborators’ needs, a strong commitment to respond to individual circumstances is not present.

John Rosenthal, a representative from the National Institute of Health, while promoting equitability as important for providing incentives for conservation, outlines options that corporations and research institutions have at their disposal for entering into bioprospecting agreements. Regarding advance payments to source countries for access to their natural resources, Rosenthal (1996) writes:

We have found that commercial partners have very different reactions to requests for advance payments. Some may be reluctant to provide significant monetary payments until the partnership is showing productivity, but are willing to donate used equipment to host countries, especially machines that aid extraction, characterization, and data management associated with the project. Others may find a lump-sum payment to be good public relations as well as a bargaining tool, while some preferred to make per-sample payments (Rosenthal 1996).

This statement conveys that commercial partners may pick and choose among options which best meet their self-interests – from developing low cost approaches, such as donating used equipment, to using agreements as public relations tools. Merck, for

instance, by entering in a contract with INBio and making a bulk advance payment, “gained considerable publicity and commendations as an environmentally responsible company” (Feinsilver 1996: 119). Feinsilver points out: “most drug companies would rather keep their options open so as to be able to get samples (if they want them) from numerous geographical locations and various institutions and collecting agencies. [...] Moreover, most would prefer not to pay money in advance for a long-term contract when they can merely pay for samples as they get them” (121).

The case of NCI presents an example of forms of compensations that are in accordance with the provider’s organizational activities. Benefits that source country partners can expect from being involved in collaborative agreements with the NCI are: payment for samples (through intermediaries), collaborative research, post-doctoral training, voucher specimens, transfer of cell lines and screening methodology, screens for cancer and AIDS, and possibility of becoming a supplier for material for further testing (Feinsilver 1996). All of the above are in line with NCI’s operation, and therefore possible for NCI to provide painlessly. While these types of aids may indeed be welcomed by source country partners, they also limit options as well as deny negotiations for defining equitability based on the source country’s true needs.

Dr. Maurice Iwu<sup>17</sup> stresses the importance of responding to specific needs of the source countries. He believes that “equity” must be linked to two issues of “access”: access to biological resources by the industrialized countries and access to relevant technologies by the source countries. Both of these accesses are granted by the Convention on Biological Diversity.<sup>18</sup> Thus, claims Iwu, both the source country partners and the industrialized country partners must be given “equal” access to each other’s resources. Iwu writes:

A commitment to involve developing countries in the research and development activities, with a small percentage of the R & D budget

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<sup>17</sup> Dr. Maurice Iwu represents Bioresources Development and Conservation Programme in Nigeria and the Walter Reed Army Institute of Research in Washington D.C.

<sup>18</sup> Article 15.2 of the Convention on Biological Diversity states: “Each Contracting Party shall endeavor to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties.” Article 16.1 encourages Contracting Parties to: “provide and/or facilitate access for and transfer to other Contracting Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment.”

channeled to the source countries, is far more valuable to these countries than the promise of large royalty payments that may never materialize. Screening strategies should include parasitic infections and diseases (e.g. malaria) to aid in the search for new treatments for diseases of primary concern to source country inhabitants, and project objectives should not be limited to the generation of pure chemical isolates as pharmaceutical leads, but should include the standardization of phytomedicines for the benefit of traditional healers and their patients (Baker, et al. 1995: 1343).

Pharmaceutical companies suggest the possibility of assisting drug development for diseases troubling the source country. However, the type of support that involves research and development is more likely to be offered in forms that directly contribute to the bioprospectors objectives such as the transfer of equipment related to the needs of bioprospecting project itself. For example, among the five ICBG projects:

Laboratory equipment related to the preparation, extraction, storage, and microbiological screening is commonly transferred to the source country. Other equipment purchases include herbarium storage cases, computers, software, and field equipment to aid with biodiversity description and management. Infrastructure development efforts include vehicle purchases, renovation of laboratories, herbaria, and a medical clinic, and improvements to a community managed ecotourism lodge (Rosenthal 1997).

Providing material contributions as compensation ensures efficiency in the projects. It makes the shipping of biological material to labs far more cost effective if plant extracts are prepared locally. Bristol-Myers Squibb contributed used equipment worth approximately \$20,000 to Suriname's local pharmaceutical company that prepares the plant extracts before shipping them to be screened at the pharmaceutical company and Virginia Polytechnic Institute and State University (Kingston, in press). Merck, also donated over \$180,000 in equipment to enhance INBio's extraction capacity and to discover novel chemical agents.

Training for local plant collectors and parataxonomists is also commonly provided in the name of research partners' contribution to local communities. Such training that will make sure that plant collectors are trained to efficiently and accurately

carry out their tasks makes perfect sense for researchers and pharmaceutical companies to provide. While training and equipment donations are often promoted as contributing to the source country's capacity building efforts, they are actually cost-effective and low-risk compensations that will ensure the quality of samples and improve research efforts for those who provide such compensation.

It may be highly beneficial for a source country to establish a local pharmaceutical industry that is capable of developing screens relevant to local disease problems, which the transnational pharmaceutical companies are likely to ignore. It would be advantageous if a source country were able to build a highly efficient and sophisticated screening industry that would attract pharmaceutical companies to outsource some of their procedures. Andes Pharmaceuticals, Inc. is a natural drug discovery company dedicated to transferring technology and expertise for the source countries to conduct more screening activities. Andes proclaims that its approach creates significant opportunities for transferring biotechnology to developing countries and furthering their scientific capacity as well as to add greater value to the source countries' biodiversity. The drawback is that when source country partners engage in joint ventures with Andes, they are required to take greater risks in order to enjoy greater profits (Feinsilver 1996). Andes is a company still in its development stage, and the outcome of Andes' joint ventures is yet to be evaluated.

The ideal situation, however, would be difficult to attain for many. For most less-industrialized countries, to develop their own pharmaceutical industry is out of reach. It is unlikely that scientific and technological capacities can be built to the level that can compete against powerful institutions of industrialized countries. If source countries cannot develop cost advantages in performing primary or advanced screening that will increase their net earnings, investing in scientific and technological capacities will not bring them long-term profit (Simpson, Sedjo, and Reid 1998). Rather than elevating to an autonomous scientific and technological infrastructure in the source country, a more likely outcome of equipment and training contribution in bioprospecting projects is a perpetuation of the status quo as yet another instance in which large corporations transfer production to low-wage laborers of the developing world.

Yet, capacity building or the “long-term development of the scientific, commercial, and management capacity of source countries” is said to be the “single most valuable benefit of bioprospecting research and development work” (Rosental 1997). Capacity building compensations may be useful for countries such as Costa Rica, where national biodiversity project is underway in an established manner. The taxonomists trained for the Merck agreement will be in demand for other projects related to biodiversity. However, as long as what capacity to build is left up to the providers, and not to what truly correspond to the circumstances of the source country and community, there is a good chance that once the bioprospectors have left, the local services would no longer be needed. Capacity building very likely is promoted as an important means of benefit sharing because it is a low-risk and low-cost method of compensation for commercial partners and research institutions. It is easily justified since the widely held conception maintains that investment in scientific capacity is in itself a desirable “development” strategy.

“What is equitable?” is indeed difficult to define due to important differences between the parties involved. As Jonathan Lash, President of World Resource Institute suggests:

Since wealth and technology are as concentrated in the North as biodiversity and poverty are in the South, the question of equity is particularly hard to answer in ways that satisfy everyone with a stake in the outcome. The interests of bioprospecting corporations are not the same as those of people who live in a biodiversity “hot spot,” many of them barely eking out a living. (Reid, et al. 1993: vi).

What is missing from the discussions on compensation is in most cases the recipient’s perspective. The answer to the question, “who decides what is equitable, for whom?” tends to remain in the hands of the more economically and politically powerful players.

It is worth mentioning the case of Shaman Pharmaceuticals, Inc. because their approach to equitability is somewhat original. Shaman has emphasized providing immediate reciprocity in a variety of forms requested by the local people themselves who collaborate in the company’s effort to identify and collect valuable plant samples. Responding to local needs and requests are what defines “equitability” for the company.

The forms of reciprocity that Shaman has provided vary from building an airstrip to providing a fresh water spring to giving financial support to shaman's son in order for him to apprentice with his father.

According to Stephen King of Shaman Pharmaceuticals, the most common request from the local communities has been to provide for health care support to help treat diseases that are not cured or ameliorated by traditional medicines. Among these are diseases that were newly introduced to remote villages by contact with outsiders and others such as diabetes that became a problem with changes in lifestyle and eating habits. A western physician travelling to remote villages with the company's research crew provides the requested health care services. The physician also fulfills another role as research collaborator. He/she and an ethnobotanist meet with traditional healers to learn about the illnesses and wounds they treat and corresponding remedies that they use. The physician's role is to assess the types of conditions that are subject to the shaman's healing practices, while the ethnobotanist identifies and collects the medicinal plants and records their usage. In a way, the compensation that Shaman Pharmaceuticals provides is a convenient type of reciprocity for the company to offer. The same physician both improves the quality of the research of the company and offers local health care which helps establish a relationship with the traditional healer and the community.

### 1.5 Conclusion: The Dynamics of Bioprospecting Rhetoric

The dominant discourse of sustainable development is what makes the "win-win-win" proposition conceivable. This proposition articulates the three goals of bioprospecting as *Interdependent*. Pharmaceutical bioprospecting gains its main approval from the idea that it will stimulate the economy in the source country sufficiently to provide incentives and/or funds for conservation of biodiversity. Participants in bioprospecting projects generally have objectives related to at least one of the three goals presented by the proposals and try to achieve their goals while negotiating favorable terms for themselves. Source country partners generally receive some type of reciprocity for granting access to their biological resources. However, appropriate compensation is often defined not by the recipients, but by the providers, who can justify their offers through discursive appropriation. The Convention on Biological Diversity adds complexity by seeming to

empower source countries by acknowledging sovereignty over biological resources while adding another layer of control by requiring source countries to fulfill certain obligations related to conservation.

In this chapter, I provided a background for subsequent chapters. I highlighted the hierarchical relationships underlying the rhetoric of bioprospecting and showed how discourse is mobilized to mediate power. At the same time, I portrayed bioprospecting proposals as providing a space where multiple interest groups meet to pursue their own ends. Put another way, the three-tiered goal attracts different parties to “collaborate” in the projects. The subsequent chapters will show that although indigenous people do not participate in constructing the rhetoric, they are enrolled to *collaborate* in this endeavor to achieve goals that are *interdependent*.

## Chapter Two: Indigenous people as *stewards* of biodiversity

### 2.0 Introduction

When different people speak of compensating indigenous peoples in the context of bioprospecting proposals, what they mean depends greatly on their perspectives. One may suggest rewarding the people for being the custodians of the biological resources and another may insist on repaying them for the right to employ their intellectual property. One discussion of bioprospecting reads:

Intellectual property rights should be extended in some form to traditional knowledge, and mechanisms to provide appropriate protection and compensation are urgently needed..... Multinational corporations, anthropologists, botanists, and others involved in the use of natural products and traditional knowledge need to recognize their responsibility to provide reasonable compensation as an integral part of their business or research and development activities (Schweitzer 1991: 1297).<sup>19</sup>

This statement reflects the claim that within the context of endeavoring to discover new drugs, the indigenous people are entitled to receive equitable benefits from the commercialization of their knowledge.

Bioprospectors generally acknowledge that in the past traditional knowledge was collected and published or used without prior consent of the informer and without appropriate reward in the past. They state their new commitment to obtain informed consent of their knowledge contributor and to consider returning benefits through royalty payment and other means.<sup>20</sup> Article 8(j) of the Convention on Biological Diversity, which officially promotes the equitable sharing of benefits with informers of indigenous knowledge, is viewed as a turning point from exploitation to protection of indigenous

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<sup>19</sup> From the general principles developed as a result of the Workshop on Drug Discovery, Economic Development, and Biodiversity Conservation.

<sup>20</sup> Baker et al. (1995) lists policies or guidelines from institutions such as NCI, ICBG, University of Illinois at Chicago, University of Mississippi Research Institute of Pharmaceutical Sciences, Bristol-Myers Squibb Company, Glaxo Group and Companies, Merck & Co. Inc., Shaman Pharmaceuticals, Inc., and SmithKline Beecham. It is my observation that these institutions usually express commitment to informed consent and reciprocity. Schweitzer (1991) state: 'compensation for traditional knowledge need not always be in the form of cash, although financial compensation is important. Other forms of compensation could include technology transfer, training, resource maintenance, and institutional development (1297)

knowledge of medicinal plants. The Article specifies that the utilization by outsiders of the “knowledge, innovations, and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity” should be equitably compensated (Convention on Biological Diversity, Article 8(j)).<sup>21</sup>

Some discussions of bioprospecting, while still encouraging reciprocity towards indigenous people, focus on the people’s assumed role in conserving biological diversity:

A central theme has been the fact that the developing countries and their indigenous peoples are the custodians of the vast majority of the world’s genetic resources, and that conservation of these resources requires fair and equitable collaboration and compensation in the development of their resources, as well as just recognition of the inventive and intellectual contributions of the indigenous peoples to the knowledge of the use of these resources (Baker, et al. 1995: 1328).

This statement combines the argument that indigenous people should be compensated for their knowledge with the suggestion that indigenous people should be rewarded for conserving and being the custodians of useful natural resources.

These two concerns, namely the conservation of biological resources and the fair treatment of the indigenous people who maintain and provide useful knowledge and raw material to researchers and industrial users, are both related to the idea of compensation. As Brush points out, as global interest in commercially valuable plants and other biological resources increased, it brought about two linked, but somewhat different concerns: the increased value of biological resources and the rapid loss, or the scarcity, of such resources. He states:

Attention to value and profit leads to concerns about fair treatment for people who nurture and provide plant resources to industrial users. Attention to the scarcity of biological resources leads to concerns for conservation. The

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<sup>21</sup> The Convention on Biological Diversity Article 8(j) states:

Each Contracting Party shall, as far as possible and as appropriate 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

inevitable conjoining of value and scarcity gives rise to the idea that compensation for biological resources can address both equity and conservation (Brush 1996: 10).

This conjoining of value and scarcity suggests that there can be a three-way equation formulated among ‘equity,’ ‘conservation,’ and ‘compensation.’

However, the issue of ‘equity’ quickly gets absorbed into the other two elements. As discussed in the previous chapter, the discourse of sustainable development makes strong connections between environmental conservation and the economic growth of developing countries, which are two of the three goals of bioprospecting. Compensations associated with conservation can be legitimized as fulfilling the need to provide economic benefits to the local population and to make efforts toward conservation. The difficulty in defining “equity” may increase the impetus to connect ‘equitable’ compensation directly with conservation. Bioprospecting proposals tend to shy away from pursuing what “equitable” means from the perspective of the local peoples. From the eyes of the providers of compensation, it is possible to justify an investment in the preservation of potential future resources. “Equity,” from the investors’ perspective, is viewed in terms of subsidizing the cost borne by the indigenous people for sustaining biodiversity. There are multiple sources of pressure that favor collapsing the three-way formula into a two-way equation between conservation and “equitable” compensation.

The argument that compensations to indigenous people can be delivered in the form of conservation efforts relies upon the definition of the people as *stewards* of the environment. While indigenous communities may indeed assume the role of stewardship in sustaining their environment, the identity of “*stewards*” assigned to them may not necessarily reflect their self-definition. Multiple forces shape the *stewardship* identity for the indigenous people and create a regime of representation that places the people in various coordinates of control. They may be portrayed as a potential threat to the environment, who can be converted to *stewards* with proper guidance. Or they may be depicted as allies of environmentalists whose goals are to preserve biodiversity, and so

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of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.

forth. In sum, by assigning the role of “*stewards*” to indigenous people, bioprospecting rhetoric justifies conservation-related compensations and interventions.

This chapter examines the power relationships mediated by “conservation” and “stewardship.” It consists of three parts. The first section elaborates on how problems with defining “equity” tend to drive discussions on compensation towards “conservation.” The second section discusses how nature and its inhabitants become a target of investment from the investor’s perspective – nature is considered a reservoir of future value and treated as internal to capital. The last and most important section examines the impact of the assignment of the role of *stewards*, which is typically imposed from the outside on the indigenous people of biodiverse areas as their identity. I demonstrate how the representation “*stewards*” has been constructed and assigned to indigenous people so as to discursively manipulate their role in bioprospecting efforts and to legitimize interventions in their affairs.

I do not mean to deny that monetary and non-monetary compensations given to the local population and indigenous people through bioprospecting agreements can be products of good will and that the local community may indeed experience positive impacts. Rather, I wish to point out that the people are appropriated as *stewards* in the dominant discourse regardless of their self-definitions. The constructed notion of helps define what counts as an “equitable” compensation. A critical analysis of the rhetoric reveals that in the name of benefits delivered to the *stewards* of environment, bioprospecting proposals reach into small pockets of remote areas of the world to enroll the population into playing imposed roles that conforms to the dominant discourse.

### 2.1 Equity, conservation, and compensation

The question of what consists of ‘equity’ for the indigenous people and what is an ‘equitable benefit sharing’ for the commercialization of indigenous knowledge has no simple resolution. Few would disagree that a “comprehensive policy for compensating communities for the intellectual property would be difficult to achieve (and probably unworkable)” (Laird 1993: 122). Indigenous rights advocates have started their efforts toward ensuring equitable benefit sharing of the commercialization of indigenous knowledge by debating the application of Intellectual Property Rights (IPR) to

indigenous knowledge. Their ultimate objective, and what I might suggest as an idea of striving towards “equity,” would be the “securing for indigenous societies mechanisms to control access to their cultural knowledge and to extract compensation for certain authorized use by outsiders” (Greaves 1994: 5).

Though attractive as an established legal means to protect intellectual property, a number of problems have been pointed out for applying IPR to indigenous knowledge (Brush 1996; Greaves 1994). For example, copyrights and patents are for *new* knowledge because such laws were developed in order to encourage new innovation under the western concept of progress. Indigenous knowledge, nurtured over generations does not fit into the concept of novelty. Also, copyrights and patent laws are based on individual ownership rights so that access by others may be denied or controlled. Knowledge shared by the community cannot be protected by IPR. For the indigenous people, it may be socially, culturally, or politically inappropriate to assign knowledge ownership to individuals. Some knowledge may be considered a community knowledge – the ownership of which extends beyond one individual or beyond one village to a wider region. Other knowledge may be inappropriate for sharing to begin with, if it is a specialized knowledge the right to which is based on age, gender, heritage, or profession. The question as to who owns a particular indigenous knowledge and thereby to whom the benefit should be delivered often does not have an appropriate answer.

The difficulty of determining the ownership of indigenous knowledge of medicinal plants is demonstrated by the case of Shaman Pharmaceuticals’ patent application. Shaman Pharmaceuticals is generally known for their culturally sensitive approach to collecting ethnobotanical knowledge, providing compensation based on local requests, and their overall concerns for the indigenous communities. Yet, the company has been criticized for a patent application in which no indigenous community was mentioned even though the information for the development of the product was ethnobotanical (Feinsilver 1996). In response to the criticism, Stephen King, Vice-President for Ethnobotany and Conservation of Shaman Pharmaceuticals, explained that the plant in their patent application was widely known and used throughout South America and that they were unable to pinpoint its origin to a specific community (Feinsilver 1996). Feinsilver anticipates multiple problems. For instance, all

communities that possess the same knowledge but were not asked for it by Shaman may contest the 'rights' of those selected by Shaman to provide information, and thus benefit. Also, because U.S. patent law does not allow for the inclusion of indigenous peoples or communities in patents, these communities have no protection under law unless they have a separate side agreement (contract) with Shaman for a portion of future profits (Feinsilver 1996). Because there have not been any profits to share, questions as to which communities would be included as benefit recipients have not been addressed. Shaman has opted to delay the decision by promising to pool royalties to its subsidiary trust fund, the Healing Forest Conservancy, and distribute benefits to appropriate groups later.

The use of contracts has become attractive for bioprospecting proposals in order to avoid some of the difficulties associated with applying IPR to indigenous knowledge protection. Contracts allow ownership to be assigned to a non-individual and to existing knowledge for a desired length of time. The type of compensation and the timing of its delivery can also be negotiated between the knowledge providers and users. While contracts may overcome some of the problems presented by IPR, they do not escape having to deal with the issue of knowledge ownership. There also remains the problem of ensuring that the promised royalties will be delivered in the future as well as deciding on an 'equitable' amount to be returned to the information source.

The complications associated with dealing with equitable benefit sharing may provide impetus for bioprospectors to focus on forms of compensations that are justified by 'conservation.' However, more often than not, it is the discursive articulation that allows this to happen. For instance, Reid, et al. (1993) write:

Done well, biodiversity prospecting can contribute greatly to environmentally sound development and return benefits to the custodians of genetic resources – the national public at large, the staff of conservation units, the farmers, the forest dwellers, and the indigenous people who maintain or tolerate the resource involved (2).

This statement identifies indigenous people as custodians of biodiversity, and suggests returning benefits to them based on their role. Compensation is tied to conservation through this identity of custodian or steward associated with indigenous people. One

may argue that indigenous people should be compensated for having nurtured valuable resources *in situ*. Another may suggest that offering compensation may provide the people incentives to continue to guard the resources. In the end, conservation projects themselves are considered an appropriate form of compensation to support the people's role as custodians. In any event, focusing on conservation makes it possible to bypass efforts to explore the meaning of "equitable" benefits from the viewpoint of the knowledge provider. "Equity" recedes into the background without a discussion beyond the rhetorical commitment to abide by the Convention on Biodiversity that encourages "equitable benefit sharing" with source country partners.

## 2.2 Stewardship and the Ecological Form of Capital

From the point of view of Brush (1993), however, the novel and more favorable way to protect intellectual property for indigenous knowledge *is* in fact conservation. He believes that the only way to recognize the value of genetic resources and indigenous knowledge is by investing in conservation or in bilateral agreements for exclusive access since the values of biological resources and indigenous knowledge are otherwise difficult to establish.<sup>22</sup> Because the value of biological resources is indeterminate, or at best understood as opportunity that cannot be determined by open market transactions, it becomes problematic to decide what consists of an equitable return for granting access to these resources. In order to overcome the lack of a current market for biological resources, Brush (1996) turns to encouraging users of genetic material to invest in future value of genetic resources. He suggests that such an approach based on future relationship links 'equity,' 'compensation,' and 'conservation.' He writes:

A more forward-looking approach to equity is grounded in conservation theory and the notion of internalizing the value of genetic resources into the overall budget of agricultural research and industrial production. This approach argues that the real balance (equity) is to recognize the future value

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<sup>22</sup> Brush (1993) points out a few reasons that an established market for biological resources or indigenous knowledge is unlikely to emerge. First, industrialized countries already store a large number of germ plasms. Also, users are able to seek alternative suppliers in other parts of the world leading to the collapse of the market elsewhere. In addition, the potential for any given genetic resource to turn into a commercial product is very small.

of genetic resources and the costs of conserving them that are borne by particular individuals, regions, or nations (Brush 1996: 13).

The future value of genetic resources is to be captured when, with the help of research and technology, useful materials are discovered and converted into marketable goods. Until then, biological resources must be preserved. Subsidizing the people who guard future resources may appear “equitable” in the eyes of the scientists and businessmen who speculate to capture their value in the future. In this sense, Brush’s argument successfully invites capitalist investors to finance conservation efforts. The argument, however, does not scrutinize the meaning of “equity” in terms of fair treatment of the people who grant access to important resources and knowledge. In this picture of future based equity, the three-way formula among “equity,” “conservation,” and “compensation” is collapsed into a two-way equation between “equitable compensation” and “investment for conservation.”

Brush’s approach – or, more generally, the idea that the current value of genetic resources derives from their future value – agrees with the new form of capital suggested by political economist Martin O’Connor. O’Connor (1993) suggests that capital, which is undergoing a significant change in form, has entered an “ecological phase.” He points out that biological materials are increasingly recognized as a part of the capital rather than as belonging to a merely external domain, exploitable ‘resources’ but as reservoirs of value – this value residing in their very genes – that scientific research, along with biotechnology, can release for capital and communities” (Escobar 1995: 203). The dynamics of capitalism changes form “from accumulation and growth feeding on an external domain, to self-management and conservation of the system of capitalized nature closed back upon itself (O’Connor 1993: 8)” (cited by Escobar 1998: 47). This new form of capital, which internalizes nature, is applicable to the situation of the rainforest biodiversity. The genes and chemical compounds residing in the rare species of the rainforest may potentially bring in significant profit through converting them into valuable commercial products using genetic engineering and biotechnology. “Capital thus develops a conservationist tendency, significantly different from its usual reckless, destructive form” (Escobar 1998: 47). Bioprospecting rhetoric relies on the recognition and discursive articulation of this new form of capital to justify their plans to sustain

biodiversity through economic activities made possible by the biological resources derived from biodiversity.

Once nature (or biodiversity) is internalized in capital, the factors that affect the sustainability of nature need to be considered internal to capital and to be managed. The support of the local inhabitants, who directly influence the preservation of the “reservoir of future value,” therefore, must be won. Not only nature, but also the local people themselves are seen as the source and creators of value, which is now considered internal to capital (Escobar 1995, 1998). As a result;

[c]ommunities in various parts of the world are then enticed by biodiversity projects to become “stewards of the social and natural ‘capitals’ whose sustainable management is, henceforth, both their responsibility and the business of the world economy (M. O’Connor 1993)” (Escobar 1995: 57). The classification of the local people as a form of capital relies upon the discursive articulation of the people as *stewards* of the environment. The following section will analyze how the regime of representation created by dominant discourses commits indigenous people to *stewardship*.

### 2.3 Indigenous People and Their Regime of Representation

Discourses produce representations which commonly come to be thought of as ‘material reality’ (Escobar 1995). Escobar (1995) maintains that regimes of representation are an apparatus of the dominant discourses for constructing identity for others and mapping them into certain coordinates of control. He argues, for instance, that development discourse constructed a regime of representation for peasants in developing countries in the 1970s. The new discourse made peasants visible as producers, whose traditional economic sector should be converted to increase production and adapt to the market economy. The definition of peasants’ role was tied to market economy and modernization and monetization of rural society. Any definitions related to those activities of subsistence and local reciprocity and exchange were denied or made invisible. Various rural development programs affecting peasants’ lives were designed based on this constructed identity of the peasants as potential producers for the market economy.

In this section, I attempt to demonstrate that the label “stewards” has been constructed and assigned to indigenous people so as to weave them into a web of forces and interests. I will describe three kinds of representation of stewardship, each of which places indigenous people on a certain axis of control. First, and most typically, the assigned identity of stewards reflects the expectation placed on indigenous people to be the *in situ* custodians of genetic resources. Second, occasionally indigenous people are associated with potential threat to the environment, who can nevertheless be converted to stewards if compensated appropriately. Third, the discourse of sustainable development enrolls indigenous people in participating in the global effort to manage the environment under the leadership of scientific and technological expertise. These sometimes conflicting identities comprise the regime of representation for indigenous people, which subject the people to various interventions. This section examines the various expectations and political intentions that are built into the constructed role of “stewardship.”

#### *Stewards as in situ custodians*

*In situ* conservation is now accepted as part of the long-term solution to conserving the store of biodiversity threatened by such activities as tropical deforestation and agricultural intensification.<sup>23</sup> Botanical gardens and seed banks cannot capture the total amount of biological diversity in a tropical forest nor can they replicate the natural and human selection and hybridization that continue to generate new resources in a natural setting. A number of anthropologists and environmentalists have caught on to the recognition that *in situ* conservation requires the support of the indigenous people who live among the natural resources and possess the knowledge and skills to utilize their environment sustainably and protect biodiversity.

The Kantu, a tribal people of West Kalimantan, Indonesia is an example of indigenous people who practice *in situ* conservation of rich biodiversity. Michael Dove (1994) reports that they have traditionally maintained a biodiverse environment mixed with sections of primary and secondary forests, rubber, and food, medicinal and material crops. They also represent indigenous peoples who are pressured by the government-

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<sup>23</sup> (Brush 1993)

supported logging concessions to give up their forest. In response to the pressure from logging concessions, the Kantu have started to fell the primary forests themselves in order to plant other crops and strengthen their claim on the land (Dove 1994).

Environmentalists regard this kind of situation as a case in which the objective of the environmental organizations and the interest of the local people coincide. Dove describes this relatively new phenomenon as a “growing overlap of interest between the international lobby for resource conservation and the international movement for local rights” (Dove 1994: 58). He quotes Breckenridge, who writes:

Local community empowerment has become a force for achieving the international goal of sustainability and international oversight has become a means for ensuring the empowerment of local communities. A synergistic alliance of global and local interests that places sovereignty in a new context has formed. Increasingly, environmental organizations endorse local communities’ “rights” while indigenous peoples and other local communities adopt the language of international environmental protection, assuming the role of “trustees” on behalf of a broader community (Breckenridge: 1992).

The merging of the interests of environmental organizations and indigenous rights advocacy, however, can be viewed cynically as the environmentalists tapping into political ferment on behalf of indigenous land rights and indigenous people hopping on the biodiversity bandwagon (Takacs 1996)

Some strands of liberal environmentalism regard biodiversity as containing valuable resources that need to be protected in order for their value to be released for capital in the future.<sup>24</sup> Bioprospecting rhetoric adopts their argument and promotes biodiversity conservation assuming that biodiversity is a scarce resource with economic value that must be managed rationally. And because biological material has potential future value, “communities --particularly ethnic and peasant communities in the tropical rainforest areas of the world – are finally recognized as the owners of their territories (or what is left of them), but only to the extent that they accept seeing and treating territory and themselves as reservoirs of capital”(Escobar 1996: 57). Bioprospecting proposals

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<sup>24</sup> As compared to more radical environmentalisms such as deep ecologist, social ecologist, ecofeminist, and eco-socialist.

present indigenous people as protectors of future value. While indigenous people do often engage in stewardship of the environment, the values associated with their activities may be very different from the economic value in the capitalistic sense. In fact, commercialization of nature should be considered a cultural characteristic peculiar to the capitalist economy, which gets inadvertently imposed on other cultures by liberal environmentalists who “extrapolate the occidental economic culture to the entire universe” (Escobar, 1996: 53). The recognition of indigenous people as *in situ* custodians is not without expectations towards them to fulfill a role that is in line with the intentions of those who take interest in biodiversity conservation.

*From an environmental threat to stewards of the environment*

The discourse of sustainable development sometimes projects an image of the local inhabitants as a threat to the environment – or as “poverty-struck” people compelled to recklessly exploit their environmental resources (Dove 1996; Escobar 1995). The increasing visibility of local populations has the effect of conveniently drawing attention away from the environmental damage caused by development. As Escobar (1995) elaborates:

The poor are now admonished for their “irrationality” and their lack of environmental consciousness. Popular and scholarly texts alike are populated with representations of dark and poor peasant masses destroying forests and mountainsides with axes and machetes, thus shifting visibility and blame away from the large industrial polluters in the North and South and from the predatory way of life fostered by capitalism and development to poor peasants and “backward” practices such as swidden agriculture (Escobar 1995: 195).

The attention on local populations largely ignores the fact that the pressure that ‘poor’ people put on the environment is often the result of the development process, which disrupted their habitats and occupation and displaced their society at large (Escobar 1995). These images of dark poor peasants popularized through the sustainable development discourse increase the attraction of proposals to help ‘poor’ local people stop environmental destruction. The ICBG Request for Application suggests that benefits

must be extended to the local communities, who are to be the stewards, if they are to participate willingly in this endeavor to preserve biodiversity:

Likewise, to be effective, efforts to protect biological diversity must include the active participation of affected local communities, which ultimately will determine the success or failure of those efforts. Biological resources must benefit local populations if the resources are to be conserved (ICBG 1997).

This statement reflects the idea that without benefits reaching the local communities they may destroy their biodiverse environment, but also that if local communities are actively involved, bioprospecting projects can foster conservation and stop destructive use. Bioprospecting agreements, in other words, can convert potential destroyers into stewards of the environment.

This is an appealing argument for those who wish to promote the bioprospecting rhetoric by linking it to sustainable development discourse. Bioprospectors embark on the mission of converting the local people into stewards of biological resources. Although indigenous people are not considered categorically the same as ‘peasants’, they are often considered as local people who hold valuable and endangered knowledge on sustainable use of natural products. This makes the indigenous people an especially favorable target for keeping their stewardship. The issue of reciprocating for sharing indigenous knowledge can now be legitimately discussed in terms of giving motivation to the local people to conserve useful resources and knowledges. Rosenthal (1996) maintains:

Ethno-medical knowledge from source country participants can also be explicitly rewarded in the royalty structure of agreements as intellectual contributions to an invention. Such a reward may provide incentives for “in-situ” conservation of the knowledge and the plant or animal species to which it relates (6).

This statement makes a problematic assumption that economic incentives will universally drive the government, organizations, and local people of the source countries towards conservation. Nevertheless, such assumptions are not uncommon. Wages paid to individuals and shamans who assist in plant collection efforts, for instance, are considered to provide direct economic benefits that will help the local population to

recognize the value of conserving local knowledge and resources (Kingston et al., in press).

Other reciprocities provided to local communities can also be viewed as the missionaries' attempt to heighten the residents' awareness of the importance of natural resources and to urge them to become stewards of their local environment. For instance, in the course of providing health-care support as immediate reciprocity to the local communities that assist their research, Shaman Pharmaceuticals Inc. make an effort to promote the usefulness of traditional medicine. The intention is to stimulate and strengthen health-care independence in the local culture as well as to have an effect on the preservation of medicinal plants in the area (King 1991).

### *Stewardship and global environmental management*

The expectation placed upon indigenous people to perform the role of stewards has an additional source. The sustainable development discourse articulates the environmental crisis of the world in a way that has made it a 'global problem' for the entire earth's population. The rhetoric assumes that all inhabitants of the earth are equally responsible for preventing further degradation of the environment. As a citizen of the earth, all of us, including indigenous people, are now expected to serve as the *stewards* of our immediate environments and "share responsibility for sustainable development and/or management of natural resources"(King 1991: 21). However, the portrayal of the ecosystem as a globally shared problem ignores the 'local' needs, problems, and degrees of contribution to environmental destruction. Rhetoric that bases its argument on "global environmental management" does not always see that "there are great differences and inequities in resources problems between countries, regions, communities, and classes" (Escobar 1998 :51).

In addition to enrolling the source country and its people to fulfill their responsibilities for sustainable development, this discourse perpetuates the prevailing power relationships among the participants of this global environmental management effort. The interests of a group of people who are determined to maintain their privileged positions in the existing models of growth and development are behind this discourse, which purports to reconcile economic growth and preservation of the environment

without significant adjustment of the market system (Escobar 1998). The same group of people – scientists, businessmen, financial institutions, and development specialists of the industrialized countries as well as a few political and economic elites of the less-industrialized countries – assumes leadership in global environmental management by relying on the scientific and technological expertise and economic resources they possess. Others are expected to follow their lead, and local interests are morally obliged to line up with the larger interest (Shiva 1993).

The experts of the industrialized countries believe that, in light of their superior knowledge, they must assume the lead in deciding what is best for meeting sustainable development objectives globally. For instance, The Healing Forest Conservancy, Shaman Pharmaceutical's trust fund, based in the United States ran a program called the Medicine Woman Program, which provided women education and training to add value locally to medicinal plant resources. The project was also intended to address population growth, another factor convicted in the sustainable development discourse of contributing to environmental destruction. "Ecological impacts may magnify," declare King et al. (1994) arguing that if these women trained by the program can find a job, they are typically more likely to choose a job over having another child, "effectively lessening the population pressure on natural resources" (King, et al. 1994: 177).

By articulating indigenous people as stewards, bioprospecting proposals borrow discursive powers of the dominant discourse to legitimize their arguments and interventions. The cumulative effect is to invite indigenous people to participate in conservation efforts. The invitation to participate in sustainable development, however, calls forth a paradox. Dove (1994) argues that if compensations do reach the remote local communities, the process may risk altering their pattern of biodiversity maintenance and undermining the basis for biodiversity conservation. People living without access to commercial agriculture, for instance, pursue risk-averse and thus diversified agricultural strategies. In a sense, there is a need for marginality in order to maintain biodiversity. As the margins develop contact with the centers, they become increasingly influenced by modern agriculture, thereby losing the genetic diversity that modern agriculture, ironically, relies upon. While requiring marginality to maintain biodiversity, there is a

tendency for the centers to incorporate the other, to make it same as the self. “There is a paradox, therefore, in any effort (by the global system) to manage that which suffers from (or change under) management. The paradox lies in the attempt to incorporate the role of the ‘other’ while maintaining its otherness” (Dove 1994: 48). When people at the center find interest in the margins, they are tempted to try to manage and control them. They attend to the role of the local communities as custodians of the environment and attempt to manage them without taking into consideration adverse effects that may result. Various projects in the name of compensation and development may actually run the risk of interfering with the autonomy of the local people and altering their cultural relationship with the natural environment.

Nevertheless, Breckenridge (1992) holds that the synergy between the concerns about the global environmental and about local people’s rights may yield a “powerful alliance for change that challenges current government decision-making and seeks solutions through international law.” Without denying that such an alliance may empower the indigenous communities against their national governments, “international oversight” may produce additional imposed obligations for the indigenous people. There is a subtle but important distinction between voluntarily assuming the role of ‘trustee’ and being assigned that role. The language of international environmental protection that the indigenous people are expected to learn may very well be foreign to them. Being co-opted into the role of “stewards of the reservoirs of value” means accepting integration into the capitalist expansion. This very act reduces the distance from the center, which accounted for the distinctiveness of the indigenous people, their culture, and their relationship with nature. It risks playing the game by the capitalist rules and remaining at the bottom of the existing power structure. The increased visibility of the indigenous people is a double-edged sword, which simultaneously opens up room for the people to struggle for more power and and pressure them to conform to the dominant expectations.

#### 2.4 Conclusion: The Appropriation of Indigenous *Stewards*

The interests and assumptions held by the people who construct the bioprospecting rhetoric underlie the references made to the indigenous people as *stewards* are. The precise roles assigned to these people are woven into the rhetoric of stewardship depend

on the intention of the speaker. “Stewards” may be the ones who possess the knowledge of sustainably exploiting the natural resources. They may be the ones who ought to be compensated and protected for guarding the earth’s future resources. Or they may yet be the ones who require guidance and support to save the environment along with saving themselves, or the ones who are responsible for participating in the global effort to overcome earth’s environmental problems, and so forth. Whatever the portrayal may be, the assignment of the role of *stewards* to the indigenous people in the bioprospecting rhetoric is achieved by the proliferation of the sustainable development discourse, which accelerates the co-optation of those who are politically and economically less powerful.

The attention to biodiversity has boosted the visibility of indigenous people as its inhabitants. As a result of being recognized as the *stewards* of the environment, indigenous groups may find supporters in their effort to protect their rights and empower their people. However, the proposition offered by the world’s non-indigenous population, scientists, environmentalists, and capitalists, who claim to share interests with the indigenous people with regard to the preservation of their environment, must be examined cautiously. Adopting the language of the dominant discourse runs the risk of being enrolled into the role that has been assigned to the indigenous people, which falls short of achieving self-determination. The challenge is to make use of the space opened up for the indigenous people to struggle for their empowerment without becoming a servant of the dominant discourse.

*Stewardship* discussed in this chapter, concerns a certain kind of knowledge that indigenous people are assumed to possess, namely knowledge leading to the preservation of biodiversity. The following chapter deals with another type of knowledge with which indigenous people are often associated in bioprospecting proposals, namely the knowledge of medicinal plants that may lead to the discovery of new drugs. Though different in kind, within the rhetoric of bioprospecting, both kinds of knowledge are linked to the images of the people who possess them. These discursive articulations weave indigenous people into a complex web of forces and interests, and allow various stakeholders to manipulate these articulations to support their arguments and activities. In the next chapter, I analyze in detail the ways in which the indigenous knowledge of medicinal plants is appropriated by the rhetoric bioprospecting.

## Chapter Three: The Rhetoric of Indigenous Knowledge of Medicinal Plants

### 3.0 Introduction

I started the previous chapter with a quote in which the authors asserted that intellectual property rights should be extended to traditional knowledge so that it would be appropriately protected and compensated for. I then suggested that, in many instances, arguments for supporting biodiversity conservation prevail over the interest in providing equitable compensation, however it is defined, for indigenous people's intellectual contribution. Nevertheless, this is not meant to suggest that discussions over the utility of indigenous knowledge of medicinal plants and the possibility of treating the knowledge as an intellectual property have not taken place. As the second section of this chapter will elaborate, ethnoscientists, in particular, have been active in promoting the utility of indigenous knowledge to the bioprospecting community (CIBA 1994; Cox and Balick 1994; Elisabetsky 1991; King 1991).<sup>25</sup> Pharmaceutical companies also acknowledge the possibility of utilizing indigenous medicinal knowledge and paying royalties should such knowledge contribute to drug development (Baker, et al. 1995).<sup>26</sup>

Commodification of knowledge by means of intellectual property rights is practiced regularly in industrial, capitalist societies. At least theoretically, the usefulness of indigenous knowledge makes it a potential commodity and makes the holders of the knowledge eligible for compensation (Brush 1993). Indigenous knowledge is drawing increasing attention as potentially useful supplement to scientific information in various professions including biology, agriculture, forestry, and development planning.<sup>27</sup> Various types of indigenous knowledge including the location of local mineral and wild plant resources, domesticated plants with interesting genetic properties, musical instruments producing evocative sounds, new ingredients for cosmetics, new foods and spices, art designs, mythic elements and stories, and sites for tour organizations have been exploited in the past to earn profit for businesses owned by non-indigenous people (Greaves 1994). These kinds of knowledge continue to present extensive commercial

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<sup>25</sup> Ethnoscientists are in the business of studying indigenous knowledge, and are in general strong advocates of the fair treatment of the people who are originators of the knowledge.

<sup>26</sup> If indigenous knowledge leads to the development of a new drug, it would be the pharmaceutical companies who earn the profit. They generally acknowledge that benefits must be returned to contributors.

opportunities for outside entrepreneurs. Scholars and indigenous rights advocates stress the urgent need to empower the indigenous population so that they may protect and seek benefit from the knowledge they hold.

The possibility of applying intellectual property rights to indigenous knowledge has been debated extensively within this context (Brush 1996, Greaves 1994). Greaves maintains that the ultimate goal of pursuing intellectual property rights is as follows:

At bottom, to seek intellectual property rights for indigenous people is to seek a legally workable basis by which indigenous societies would *own* their cultural knowledge, *control* whether any of that knowledge may be used by outsiders, and for permitted uses, require acknowledgement as its source, and a *share* of any financial returns that may come from its authorized commercial use (Greaves 1994: 4)

This aspiration, however, is no more than an ideal goal to pursue as the rights of indigenous people who possess valuable medicinal knowledge. First of all, there are practical problems, as briefly discussed in the previous chapter, in applying IPR to indigenous knowledge. More importantly, as this chapter will later demonstrate, bioprospecting rhetoric and practices treat indigenous knowledge of medicinal plants in a way which allows indigenous people no control over their knowledge. The process that traditional medicinal knowledge is taken through is disempowering rather than empowering.

This chapter consists of three sections. In the first section, I to highlight the significance of indigenous knowledge of medicinal plants in its original setting, and note that any valorization outside the local context cannot do justice to the true value of indigenous knowledge. The second section focuses on the ethnoscientists' role in inserting the rhetoric "indigenous knowledge" into the bioprospecting rhetoric at multiple coordinates of control. Ethnoscientists are instrumental in raising the visibility of the utility of traditional medicinal knowledge for bioprospecting. On the other hand, they take the control over such knowledge away from the local population by recodifying it and making it available to a wider public for utilitarian purposes. Ethnoscientists occupy an interesting position, which works both for and against the valorization of indigenous

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<sup>27</sup> Brokensha, Warren, and Werner (1980), Purcell (1998), Sillitoe (1998)

knowledge at the same time. The third section examines how indigenous knowledge is scientized and commodified through its treatment in bioprospecting. I argue that the implication of scientization and commodification is hierarchization and (de)valorization of indigenous knowledge against western measurements. I conclude that, in the end, indigenous knowledge is semiotically conquered by those who consider nature as reservoir of resources to be exploited in the future and indigenous knowledge as a means of generating capital from nature.

### 3.1 Knowledge of Medicinal Plants in Traditional Settings

This section provides an account of what is required to understand the significance of indigenous knowledge of medicinal plants in its original socio-cultural context. Such understanding will put into perspective the impact of bioprospecting practices and rhetoric on the meaning and value of indigenous knowledge. In order to do justice to the true value of indigenous knowledge, it must be recognized that it has an original context in which it deserves to be valorized.

According to the recent estimates by the World Health Organization, more than 3.3 billion people in the developing world rely on plants as components of their primary health care (Fransworth 1994). Communities around the world depend, at least partially if not solely, on traditional healers and their medicinal knowledge for the treatment of common illnesses and injuries. Diarrhea, complications of maternity, and inflammation are considered perilous for the indigenous people whose lifestyles and predicted life spans are not associated with cardiovascular disease and cancer like in the industrialized countries. The indigenous pharmacopoeia, reflecting such circumstances, has a high percentage of remedies for gastrointestinal complaints, inflammation, skin ailments, and ob/gyn disorders, compared to the Western pharmacopoeia which reflect the Western culture's need for cardiovascular and nervous system treatment and cancer drugs.<sup>28</sup>

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<sup>28</sup> Balick and Cox (1996: 56) has compiled published accounts of medicinal plant uses in 15 widespread geographical areas and compared the percentages of medicinal plants used in various treatment categories by indigenous peoples to the percentages of drugs used in the same treatment categories. Indigenous treatments focus on dermatology (15%), Inflammation (12%), and gastrointestinal ailments (15%). Western drug use in these categories are significantly lower, while remedies for cancer, heart and nervous ailments, and antimicrobial treatment score much higher.

Traditional healers have extensive knowledge of medicinal plants: where, when, how much, and which part of the plant to collect; how to process the material to produce remedies; for what kind of health problems the plant extracts are effective; how to treat the patients with them; and how to conduct the rituals accompanying plant collection and healing practices (Balick and Cox 1996). Cox (1991) reports that a typical Samoan healer, who at once performs the role of physician, pharmacist, and botanist, “can diagnose over 200 diseases that she treats with a repertoire of over 120 medicinal plants in 150 formulations” (161). In Samoa, most treatments are prepared by using a combination of several specific plants gathered in the wild after diagnosing the patient. Plants are often infused in water, some in oil, and a few ignited and inhaled by the patient (Balick and Cox 1996: 54)

Members of a given indigenous community may have a general knowledge of the basic herbal remedies, but specialized knowledge is often reserved for the healers. In Belize, for example, one of the female healers consulted by ethnobotanists specialized in midwifery and other health care issues involving women and children (Balick and Cox 1996). She used a specific set of plant species, including some powerful ones considered too toxic for use by non-specialists, to treat irregular menstruation, heavy menstrual bleeding, and lactation problems as well as more common symptoms such as headaches. Another male healer in Belize specializes in the treatment of snakebites – a common problem in the community in which he resides – while providing primary health care services as well (Balick and Cox 1996). Traditional healers in Belize treat categories of diseases, which are not recognized – and thereby untreatable – by western medicine such as *susto*, *viento*, and *envido* – fright, wind, and envy. As Balick and Cox (1996) point out, “for many indigenous populations, traditional medicine is effective, while also being less expensive, more widely available, and more culturally acceptable than Western medicine” (46).

The indigenous healing systems are often complexly embedded in the indigenous people’s belief system. Cox (1991) maintains that at least three basic components are incorporated into traditional healing. The first component is a collection of cosmological beliefs that attempt to explain the cause, nature, etiology, and treatment of diseases. Secondly, there are substances, such as plant-derived medicines, that are believed to be

efficacious in treating the sick. Lastly, there are unique cultural contexts in which various treatments are provided. As an example, Cox describes how the Navajo healing system functions under its own paradigm:

To the Navajos many diseases are caused by disharmony between the sick person and nature, possibly as the result of violating a cultural prohibition, such as entering the hogan of a dead person in the wrong fashion. In such cases it may be necessary for the person to ingest medicinal plants and undergo ritual purges, possibly in combination with a sweat bath. The treatment is guided by a healer, who sings traditional songs with the afflicted person's kin, while making a sand painting that is later destroyed, taking with it the vestiges of the diseases (Cox 1991: 148).

Just as traditional healing systems are culturally specific, the healer's relationship to medicinal plants is also culturally specific. Luiseno Indians, when gathering a ceremonial or medicinal plant, treat it "with great deference" and utter an apologetic preliminary (Wassen 1972). The Samoan healers believe that the plants they use are gifts of God and refuse compensation from their patients fearing that accepting payment for their services would cause the remedies to cease working. The Samoan knowledge systems concerning medicinal plants are passed down to a family member, most frequently from mother to a daughter. Knowledge regarding herbal formulations is regarded as personal property of a healer, which should not be replicated by others except under the owner's direction. This is based on the belief that unauthorized use of another healer's remedy will not be efficacious in healing the sick (Cox 1991).

Whitt (1998) compares indigenous knowledge to a gift given to the healer, which binds him/her to social and ecological obligations. She argues:

The knowledge that indigenous healers, hunters and farmers are given binds them, and the people they treat and feed, to the land, just as the exchange of gifts between people binds them to one another. The giving of gifts establishes a relationship between those involved; their circulation within the human world, as well as between the human and nonhuman world, acknowledges and enhances community (Whitt 1998:46).

A Dineh healer's practice exemplifies the type of reciprocal and obligatory exchange a healer has with his/her environment. The healer collects medicinal herbs for individual patients each time. The plants gathered cannot be used for anyone else, nor can they be stored and kept for use at a later time. The healer must offer a specific song and prayer to the plant for the healing spirit of the herbs to work (Whitt 1998). Their spiritual beliefs and the indigenous people's understanding of the world constructs their medicinal knowledge, which also build into their knowledge the ecological obligation that keeps the knowledge owner from over-harvesting the plants. As Deloria (1992) states, "obligations demanded by the lands upon which people lived are part of their understanding of the world; indeed their view of life is grounded in the knowledge of these responsibilities" (262-63, cited by Whitt 1998: 43).

Indigenous knowledge is a complex cultural construction that can only be understood in full in their rich socio-cultural and environmental context. To this degree, Greaves (1996) writes:

The indigenous knowledge at issue here is *collective* knowledge. Assembled by past generations and passed down to its present inheritors, indigenous knowledge is, in the main, something more than matter-of-fact information. Rather, it is usually invested with a sacred quality and systemic unity, supplying the foundation on which members of a traditional culture sense their *communitas*, personal identity, and ancestral anchorage. It provides a distinctive worldview of which outsiders are rarely aware, and at best can only incompletely grasp (Greaves 1996: 26).

The value of indigenous knowledge, therefore, can also be justly understood only in its original setting. Although indigenous knowledge of medicinal plants can be valuable outside of its original context as will be discussed in subsequent sections, it is important to note that to measure the value of indigenous knowledge in a different context may do injustice to its original significance.

### 3.2 Ethnobotanists' Rhetoric of Traditional Medicine

*Traditional medicine as a source of modern drugs*

Traditional knowledge of medicinal plants has not only been valuable for local communities, but has made significant contributions historically to the development of modern Western medicine. Balick and Cox (1996) list fifty drugs that were developed through leads provided by traditional medicinal knowledge or ethnobotanical leads. The list of drugs includes aspirin, digitoxin and digoxin, emetine, pilocarpine, proscillaridin, quinine, reserpine, tubocurarine, vinblastine and vincristine. Modern aspirin, marketed first by Bayer company in 1899, is derived from the plant called “queen of the meadow (*Filipendula ulmaria*),” which appears in European literature on herbal medicine as early as 1597 as a useful agent for the pains of the bladder.<sup>29</sup> The origin of proscillaridin, treatment for a cardiac malfunction, can also be found in the same literature as sea squill (*Drimia maritima*) that “is given to those that have dropsie.”<sup>30</sup> Dropsy is a name for the symptom of the swelling of the body that is caused by inadequate pumping of the heart. During the 18<sup>th</sup> century, William Withering, who aspired to test the effectiveness of the foxglove plant (*Digitalis purpurea*) upon learning that a woman in England occasionally used the plant to treat dropsy, administered the plant remedy to his patients. Although Withering did not understand the connection between heart malfunction and the swelling of the body, his experiments and observations became the foundation of the two drugs prescribed to thousands of patients today. The effective compounds in foxglove were later identified as Digoxin and digitoxin. The two important modern heart medicines are still extracted from the plant.

Some Western drugs owe their origins to non-European folk medicines. Reserpine, used to treat hypertension, was discovered in the snakeroot plant (*Rauvolfia serpentina*) traditionally used as a sedative in the Ayurvedic medicine of India (Balick and Cox 1996: 2). European encounters with South America have enriched the global pharmacopoeia by a number of important plant-derived medicines discovered and utilized by indigenous people. Claude Levi-Strauss once wrote: “Few primitive people have acquired as complete a knowledge of the physical and chemical properties of their botanical environment as the South American Indian” (Levi-Strauss 1950, quoted by Wassen 1972: 22). Quinine, first derived from the bark of the *Cinchona* tree in the

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<sup>29</sup> *Herball*, published by John Gerard in 1597, is a compilation of information on medicinal plants and was extensively referred to by physicians in search of herbal remedies (Balick and Cox 1996: 14).

Andean rain forests, has been used as an anti-malarial drug since the sixteenth century. The indigenous medicinal knowledge of Brazil provided a number of important drugs “discovered” by Western explorers and botanists. The amoebicide drug, emetine, and pilocarpine, a drug used for glaucoma, are both derived from plants utilized by indigenous people in Brazil as medicine (King 1991: 19). The muscle relaxant, tubocurarine, is derived from an Amazonian arrow poison known as curare (King 1991: 19). Finally, the indigenous use in Madagascar of the rosy periwinkle (*Catharantus roseus*) against diabetes led scientists at Eli Lilly to include the plant in a collection of 400 medicinal plants to be screened against leukemia cells. The study of rosy periwinkles led to the significant discovery of the vinca alkaloids, vincristine and vinblastine, now used to treat pediatric leukemia and Hodgkin’s disease.

#### *Ethnobotanists and ethnobotanical research*

Traditional knowledge of medicinal plants is being studied around the world today.<sup>31</sup> These studies are partly driven by the expectation to discover a biomedically useful agent from the medicinal plants that traditional healers use. An ethnoscientist with a particular interest in such matter would typically study indigenous use of medicinal plants and document what he/she learns from traditional healers as well as collect and identify the plants, deposit the plant samples in herbariums, and have particularly interesting plant samples tested for biomedical activity. “Most commonly,” describe Balick and Cox (1996), “the modern ethnobotanist adopts the role of participant observer, living with the people under study, observing their daily life and customs, and learning about their life style, food, disease systems, and myths and legends” (Balick and Cox 1996: 43). Ethnobotanists often speak the local language, witness rituals that accompany healing practices, and are well informed of the symbolic meaning of diseases, medicinal plants,

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<sup>30</sup> Cited by Balick and Cox (1996: 32).

<sup>31</sup> Ethnobotanists/ethnopharmacologists conduct research around the world on indigenous medicinal plants today. Of particular significance is the ethnobotanist, Richard Schultes, who pioneered the study and educated a number of followers. He worked in the Amazons for decades as a participatory observer and botanist, studying the use of hallucinogens as well as researching broadly the plant species in the tropical forest. His students include Mark Plotkin, who worked in the Amazon for a number of years as well as Michael Balick, whose work centers in Belize, and Paul Cox who is a specialist of Samoa. Just to name a few other researchers, ethnopharmacologist Elaine Elisabetsky works in Brazil, Maurice Iwu in Africa, and Stephen King of Shaman Pharmaceuticals Inc., in a number of countries.

and healing within the local cultural and socio-economic context. They often become passionate advocates of indigenous rights and play “major roles in establishing indigenous controlled reserves and ensuring that indigenous people share in the benefits of new discoveries such as medicine derived from plants” (ibid).

Ethnobotanists promote an approach to drug discovery based on an ethno-directed sampling approach. According to Balick and Cox (1996), this methodology consists of two primary components: (1) the plants are screened by the indigenous people who experiment with the plants in their environment over generations and identify those that are bioactive; (2) and then ethnobotanist consciously or subconsciously screens the plants warranting further study. Studies have shown that ethno-directed sampling show increased number of “hits” in *in vitro* studies (those carried out in test tubes) in comparison to plant samples selected randomly (Balick and Cox, 1996). Paul Cox and colleagues have studied medicinal plant species in Samoa and found 86% of them to show pharmacological activities in the test tubes. Michael Balick selected a small number of “powerful plants” used by a healer in Belize and used a National Cancer Institute screen for anti-HIV activity. The samples gave four times as many hits in the screen than a random collection (Balick and Cox 1996: 39). Although positive “hits” in the initial screening do not lead directly to the discovery of a new compound, proponents of an ethnobotanical approach to drug development argue that indigenous knowledge of medicinal plants would be a valuable resource in the endeavor to discover new biomedical agents.

Ethnobotanists’ research involves publishing their findings in journals such as the *Journal of Ethnopharmacology*. A list of medicinal plants and their usage in a particular culture, for instance, may be of interest. When an ethnobotanist learns of a potentially powerful plant from a traditional healer, he/she may request a research institute to evaluate the pharmaceutical efficacy of such a plant. In 1984, Paul Cox learned of a particular tree bark (*Homalanthus nutans*) that Samoan healers used for the treatment of an acute hepatitis. A team of scientists at NCI tested the stem wood extract against HIV-1 virus and found that the extract stopped the virus from infecting healthy cells and prevented infected human cells from dying. Chemical molecule prostratin was isolated

as the active agent from the extract. NCI is soliciting bids from drug companies to license prostratin for AIDS drug development (Cox 1991).

*Raising the visibility of indigenous knowledge of medicinal plants*

Ethnoscience has increased the visibility of indigenous knowledge of medicinal plants as a potentially valuable resource for drug development. Ethnobotanist, Mark Plotkin, and entrepreneur, Lisa Conte, founded Shaman Pharmaceuticals, Inc. in 1989. The corporation was established as a for-profit company that would focus on developing drugs based on leads from indigenous knowledge of medicinal plants. Stephen King, chief ethnobotanist of Shaman Pharmaceuticals writes:

Shaman's goal is to discover and develop novel pharmaceuticals from higher plants. Ethnobotanical information about the unique structural chemistry of tropical forest plants will help us discover new prototype compounds that act in the body in previously undiscovered receptors and body pathways.... We are combining the disciplines of ethnobotany, isolation chemistry, and pharmacology to create a more efficient drug discovery than mass screening and genetic engineering efforts. (King 1991: 20)

The positive outlook the business community placed on the company's approach is symbolized by the US \$42 million it raised when it went public in 1993 (Reid, et al. 1993: 2).

The founders' aspirations were to establish full reciprocity with the people who provide their natural resources and related knowledge and support the conservation of their culture and habitat. They believed that drug discovery and subsequent commercialization in the 1990s need a new set of reciprocal obligations and a more global and ecologically sensitive orientation because benefits generated by a number of different industries have not returned. The company has since then changed their overall strategy to focus on herbal products due to difficulties in producing tangible pharmaceutical results and bringing revenue from drug discovery efforts in the short term. However, similar approach to ethnobotanical drug research and programs to preserve and reciprocate indigenous knowledge of medicinal plants have been adopted by

non-governmental organizations such as Conservation International (CI).<sup>32</sup> There is no doubt that Shaman Pharmaceuticals should be credited for at least raising the visibility of indigenous knowledge of medicinal plants.

Another example of an ethnoscientist's effort to raise the interest in "indigenous knowledge" in the pharmaceutical bioprospecting community took place at the Workshop on Drug Development, Biological Diversity, and Economic Growth organized by the National Institute of Health (NIH), National Science Foundation (NSF), and U.S. Agency for International Development (USAID) in 1991.<sup>33</sup> The record shows that in this meeting ethno-pharmacologist Elaine Elisabetsky stressed the critical role of indigenous knowledge in drug discovery (Schweitzer, et al. 1991). She also expressed concern for the disappearance of cultures in which this knowledge is nourished, and emphasized the necessity to support the local communities. Before the workshop came to a close, participants developed principles for future directions of pharmaceutical bioprospecting projects, which included the recognition of the *value* of traditional knowledge and the necessity to protect the rights to the knowledge. The report from the workshop reads:

- Traditional knowledge is as threatened and as *valuable* as biological diversity. Both resources deserve respect and must be conserved. (General Principle 3)
- Traditional healers and indigenous people have *valuable* knowledge and important observational and analytical capabilities. These specialists may know almost all of the useful medicinal plants available in an ecosystem. (General Principle 4)
- Intellectual property rights should be extended in some form to traditional knowledge, and mechanisms to provide appropriate protection and

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<sup>32</sup> Conservation International is also affiliated with Mark Plotkin, who served as its chief ethnobotanist.

<sup>33</sup> The workshop formed the basis for the International Cooperative Biodiversity Group (ICBG). The unifying theme underlying the workshop dialogue was the belief that "pharmaceuticals derived from tropical natural products can, under appropriate circumstances, promote economic growth in developing countries while conserving the biological resources from which these products are derived" (Schweitzer, et al 1991: 1294). Participants of the workshop included representatives from NIH, NSF, USAID, and various stakeholders in bioprospecting such as representatives from the National Cancer Institute (NCI) and pharmaceutical companies, government and technical experts from six developing countries, and scientists representing universities.

compensation are urgently needed. (Schweitzer, et al. 1991: 1297 – 1298, emphasis added).

This workshop provided the conceptual basis for the International Cooperative Biodiversity Groups (ICBG) programs, which was initiated in 1992 in a collaborative effort of NIH, NSF and USAID. Between 1993 and 1998, NIH, NSF, USAID jointly funded ICBG and awarded five multilateral bioprospecting projects.<sup>34</sup> Four of the five ICBG projects involve indigenous peoples.<sup>35</sup>

### *Recodification of indigenous knowledge*

Ethnoscience is responsible for bridging between indigenous and scientific contexts. They are often well aware of the distinctive worldview constructing indigenous knowledge (Balick and Cox 1996; Cox 1991; Plotkin 1993). They may choose to report their understanding of the local culture within which they conduct their work.<sup>36</sup> However, the bulk of their research effort is spent on isolating relevant information from what they observe and learn from local healers and then translating them into a language that is accessible to other scientists. The literature in ethnobotany, ethnomedicine, and ethnopharmacology usually include information such as the Latin binomial and the common local name of the plant used, plant part(s) used, and geographical area where used (Fransworth 1994). Medical information is often insufficient due to the inadequate understanding of the medical condition by the ethnoscienceist. In the event that such information is included in the document, then the method of preparation of the medicine, dosage, and the route of administration (oral, external, rectal, vaginal, nasal, ophthalmic) are also considered relevant (ibid).

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<sup>34</sup> source: [www.nih.gov/fic/opportunities/icbg.html](http://www.nih.gov/fic/opportunities/icbg.html)

In 1998, six awards of approximately \$500,000 to \$600,000 per year were made. The second round of five year ICBG project awards were granted to seven projects in 1998. The seven projects consist of diverse public and private institutions including universities, environmental organizations and pharmaceutical companies in 11 countries.

Drug discovery and biodiversity among the Maya Mexico

<sup>35</sup> With the exception of Costa Rica, all of the first five ICBG awards involve indigenous peoples and indigenous knowledge in the source countries, including (but not limited to): Surinamese "forest people" (indigenous community not specified); Aguaruna and Huambisa of the northeastern Andes; indigenous peoples of Oban hills in southeastern Nigeria and the Korup forest of Cameroon (indigenous community not specified); indigenous peoples inhabiting dryland areas of Mexico, Chile and Argentina (indigenous groups not specified). (source: RAFI article at <http://www.latinsynergy.org/bioprospecting.html>)

<sup>36</sup> As has Paul Alan Cox (1991) on Polynesian culture, and Mark Plotkin (1993) in his travel log.

Important parts of the knowledge for indigenous knowers, such as the prayers and rituals accompanying the healing practices and constraints on where, when, and how to collect the plants are deemed irrelevant to the scientific audience, and are therefore dropped from research reports. On some occasions, the origin of the plants collected based on indigenous knowledge are coded so that the scientists who process them do not even have access to any information regarding the identity of the plant nor its traditional usage. Further down the line, if bioactive molecules are identified by deeper investigation into a particular plant extract, they then are presented in a chemical formula. What may have been once known to an indigenous healer as a sacred medicinal plant is now reduced to a group of polygons and chemical symbols.<sup>37</sup>

Ethnobotanical study retrieves particular elements of indigenous knowledge, which is a complex cultural construction, and converts them into matter-of-fact information. In other words, indigenous knowledge is *recodified* into scientific information. Escobar (1995) writes that while “indigenous” and “traditional” knowledge systems are found to be useful complements to modern biology, they are seen as “something existing in the “minds” of individual persons (shamans or elders) about external “objects” (“plants,” “species”), the medical or economic “utility” of which their bearers are supposed to transmit to us” (204). Greaves (1996) sees this act of extracting useful information and disregarding the original value of indigenous knowledge as a violent act. Greaves writes: “when outsiders appropriate a key element of this knowledge – say, a clan symbol to place on T-shirts or a sacred plant for use in a new cosmetic – we thrust a wedge between the object and its meaning, attacking the worldview and cultural matrix of the society’s members” (26).

Since many of the ethnoscientists do have genuine concerns and respect for the indigenous people that they work with, it is ironic that ethnobotanists’ role can be described as violence towards indigenous culture. On the other hand, however, this perception insightfully reflects the complex web of forces and interests that weave together the bioprospecting rhetoric. Ethnobotanists’ actions are partially self-serving when they circulate the recodified information that they derive from traditional knowledge and promote indigenous knowledge as highly useful and valuable.

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<sup>37</sup> This aspect in itself deserves attention as a research project.

Subsequently, the indigenous knowledge further gets rearticulated, and its value transformed, by other actors constructing the bioprospecting rhetoric. The following section examines the implications of these transformations.

### 3.3 The Rhetoric of the Value of Indigenous Knowledge

The rhetoric fostered by major projects like the ICBG, and amplified by such stakeholders as pharmaceutical companies, scientists, and environmentalists constitute bioprospecting rhetoric today. Reference to the utility of indigenous knowledge continues to be made in main stream bioprospecting rhetoric – enthusiastically by some and less so by others. For instance, a group of scientists write: <sup>38</sup>

Before the 1980's, the developed world displayed little interest in such indigenous knowledge, and minimal effort was expended to assist indigenous communities in preserving their unique knowledge and traditions. With the resurgence of interest in the screening of plants and other natural resources for potential medicinal properties, western research organizations are beginning to place greater value on such knowledge...Where such knowledge is accessible, the search for bioactive substances might be expected to be more effective and efficient than in the case where all samples are collected with no basis for selection (Baker, et al. 1995: 1327).

Meanwhile, Reid, et al. (1993) assesses the contribution of ethnobotanical knowledge to be modest. They write:

Still, the pharmaceutical industry as a whole remains to be convinced of the primary value of ethnobotanical data. Although many companies review ethnobotanical literature and data collected for their screening programs once an interesting compound has been isolated, initial research based on receptor and enzyme screens is so specific that companies do not generally find ethnobotanical data to be particularly relevant at that stage. Also, some in industry believe that while traditional medicine may lead researchers to bioactive compounds, the health problems they are used to treat are of limited

interest to pharmaceutical companies or have existing, more effective treatments in industrial-country medicine (Reid, et al. 1993: 120).

The gap between the two sets of authors comes from the differences in their approaches – between the narrowly targeted ethnobotanical method and the mass screening protocol that the industry pursues. Bioprospecting rhetoric maintains a double standard, which simultaneously retains the claims on the value of indigenous knowledge accompanied by proposals to compensate the people and the assertion that the utility and value of indigenous knowledge is minor to the drug discovery process.

#### *Utility of indigenous knowledge in drug development*

A considerable number of scientists, research institutes, and pharmaceutical companies harbor expectations of discovering new agents from natural sources with potential biomedical use. The chemists' main interest is to find interesting naturally produced chemical compounds that will give them ideas that may be useful for the drug development. When testing plant extracts for bioactivity, chemists may have no idea which plant the samples they are screening came from and for what ethnobotanical reason (if any) the plant was chosen. For instance, in the Suriname ICBG, Virginia Polytechnic Institute and State University and Bristol-Myers Squibb are provided with plant extracts, the identifications of which are coded upon collection by the Missouri Botanical Gardens (MBG) and Conservation International (CI). The only information available to the two institutions conducting the bioassay screening is whether the plant was collected based on ethnobotanical survey by CI or based on other botanical leads by MBG. The identification of the plant itself is hidden so as to maintain control over the information by the plant collectors. It is, however, of little concern to the chemists to know the identity of the plants or the reason of their selections since such information does not influence the screening protocols through which the plants, or their extracts, are put.<sup>39</sup> Since bioassays used by biochemical screening are narrowly targeted for specific

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<sup>38</sup> The authors of this article are members of the Ad Hoc Committee on Indigenous Materials appointed by the President of the American Society of Pharmacognosy to develop a set of guiding principles for members of the Society pursuing research involving the use of indigenous knowledge and resources.

<sup>39</sup> I am indebted to Dr. David Kingston of Virginia Tech, Chemistry Department, for allowing me to interview him for one hour (The interview took place in February 1999). Dr. Kingston's insights on the

agents such as a particular type of cancer, even were they to find a promising chemical compound, its effect may have no correlation with the type of diseases for which the plant was originally used. It seems reasonable to believe that it is rare for pharmaceutical companies to look at ethnobotanical information prior to the screening even though they may consult it once something interesting shows up in the initial screening (Reid, et al. 1993: 120).

While ethnoscientists harbor expectations in their more narrowly targeted approach using ethnobotanical leads for drug discovery, pharmaceutical companies, if they are interested in searching for novel chemical compounds in plants at all, are mainly set up to run large-scale screening tests for economic efficiency. Since most screening is now mechanized, it is more efficient for large companies to run the samples through the entire battery of assays that are active at that moment, regardless of background information (Rosenthal 1996). Under such a process, drug discovery from natural product becomes, in part, a numbers game. As Rosenthal (1997) states: “once a lead sample has been identified, skill and insight in natural products chemistry becomes important. But until that point, screening a large number of samples for a greater number of therapeutic possibilities and other uses generally increases the likelihood of finding a valuable lead.” In this numbers game, selecting plants based on indigenous knowledge becomes far less important compared to the biotechnology of effectively identifying and manipulating the chemical compounds. Thus, the information retrieved by ethnobotanists from indigenous use of medicinal plants goes unutilized in the vast majority of pharmaceutical protocols. Put another way, after indigenous knowledge is recodified into scientific information, it gets hierarchized and given a lower rank – indeed, it is often omitted – in the scientific practices associated with drug discovery.

#### *Commodification of indigenous knowledge*

We have seen that the specific contents of indigenous knowledge of medicinal plants that many think provide that knowledge with its distinctive value get filtered out through the drug discovery practice. Nonetheless, the “value” of indigenous knowledge remains in

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Surinam ICBG project, of which he is the leader, directed my attention towards how indigenous knowledge is ignored rather than valued in scientific research.

the bioprospecting rhetoric and provides the basic premise for an argument for reciprocity. Indigenous knowledge has been made into a discussible object by assigning it value. In other words, the argument that indigenous communities must be compensated for their knowledge starts by giving indigenous knowledge the label “valuable,” in particular for novel discoveries.

Novel scientific knowledge – or potential knowledge – can be treated as a commodity: that is, it can be owned and sold by an innovator. Some indigenous rights advocates have hoped that indigenous knowledge, because it is potentially useful, will qualify as a commodity, thereby giving the authors of the knowledge an opportunity to claim compensation in return for their contribution to science (Brush 1996). Recodification, for this endeavor, is a necessary step before indigenous knowledge can be considered commodity. As a commodity, knowledge is then valorized and measured by capitalist standards in order to determine the compensation it deserves.

The dominant perspective of the pharmaceutical industry is that indigenous knowledge should be compensated based on its *relative value* in comparison to the value of other intellectual property that entered in the drug development process (Schweitzer, et al. 1991: 1296). This argument quickly turns into the conclusion that indigenous knowledge is *relatively* unvaluable. For example, a commercialized product that is a direct isolate or very similar to the original extract provided by source country partners may pay a higher royalty than one that is synthesized by the pharmaceutical company but based upon a lead encountered in the original extract. According to this argument, it is almost predetermined that the provider of the raw material or knowledge will be paid less since it is more common for biologically derived leads to be chemically modified in order to enhance the compound’s therapeutic value or to eliminate some of its side effects. Furthermore, Rosenthal (1996) suggests that a product identified by a mechanistic assay developed by the drug company would pay a smaller royalty to the source country than a product found in a classical functional assay. The justification for this argument is that mechanistic assay must be developed by the industrial partner using a great deal of intellectual property, and therefore the contribution of the raw material must be considered relatively smaller.

The initial crude extract or the lead provided by indigenous knowledge is the same regardless of what procedure the industrial partner employs in pursuing it. The value of the plant or knowledge for the provider is not at all affected by what the user does with it. However, the above argument regarding *relative value* of indigenous knowledge reveals that the value of knowledge is arbitrarily decided and manipulated by the users, not the providers. It is likely that the assigned value will be downgraded for whatever reasons the users may give. Even though an agreement such as the one in the Suriname ICBG pays a higher royalty to a trust fund if a commercialized drug is related to a documented traditional use of the plant, the same agreement also states that the documentation must be on a “*relevant* traditional use for the species that produces a commercial discovery” (Reid, et al. 1993: 37). This makes it unlikely that indigenous knowledge would be credited for the development of drugs for diseases such as cancer and AIDS that are rarely treated by traditional healers.

The relative value of indigenous knowledge can easily be minimized by pharmaceutical companies, which can usually make a case that the scientific contribution of indigenous knowledge to drug development is *relatively* little compared to other intellectual properties. In other words, irrespective of the value of the knowledge in the original context, it is devalued when commodified and measured against outside standards.

When commodified, the original owner of knowledge loses the control he/she had over the knowledge. Whitt (1998) argues that the original state of indigenous knowledge can be likened to a gift, which binds the knowledge owners to social and environmental obligations. And when indigenous knowledge is converted into commodity, the obligatory connection is no longer valid. Whitt writes:

When gift is rendered as a commodity, it undergoes a change in metaphysical status that facilitates such loss of control and potential abuse. Gifts are inalienable; when a gift is exchanged the continuity of social relationships ensures that it always remains the giver’s. Thus the giver remains in a position to influence and guide the disposition of the gift. Commodities, by contrast, are alienable. When they are exchanged, so is effective control over the disposition of the commodity. The “social distance and independence of

the transactors' in the marketplace leaves the seller of the commodity unable to influence its use (Berg, 1991, p.363)" (Whitt 1998: 49).

Once the knowledge is released to bioprospectors, indigenous people have little control over how the knowledge and/or the raw material are treated by drug developers and over how traditional knowledge is valorized. If comparable knowledge has already been published, it is even more difficult to claim for a credit. While agreeing to provide compensation for the use of the intellectual property of indigenous peoples, Baker, et al. (1995) write:

[A] large body of ethnobotanical information already exists in the public domain in the form of books or journal articles. This information is readily and equally available to all members of the scientific community, and it is unrealistic to expect compensation for the use of information that has been previously published by a third party without restriction. (1331)

Research publication by ethnobotanists fall into this category of already published information. It is somewhat ironic that ethnobotanists are one of the strongest advocates of indigenous rights. While they have succeeded in promoting the richness of indigenous botanical knowledge and distributing the information for utilitarian purposes, they also have allowed their informers to lose control of their knowledge.

### 3.4 Conclusion: The Semiotic Conquest of Indigenous Knowledge

Within the discourse of bioprospecting, "indigenous knowledge" is appropriated on various axes of control, which relate to and conflict with one another. The "value" of indigenous knowledge is promoted based on the interests of multiple participants. For instance, an ethnobotanist's interest may lie in proving the efficacy of traditional knowledge and finding ways to preserve that knowledge and support the culture, habitat, and environment, or secure the fair treatment of the people who generously shared their knowledge. On one axis, the notion that indigenous knowledge has "value" makes it possible for the Convention on Biological Diversity (CBD) to officially declare the necessity of returning an equitable share of the benefits derived from indigenous knowledge to the people. The rhetoric of CBD is then recycled to propose certain types of reciprocity for indigenous people. On a different axis, the value of indigenous people

is diminished by the argument that traditional knowledge contributes relatively little to drug discovery. The various axes are played off accordingly to justify particular treatments of “indigenous knowledge.”

One way to shed light on these phenomena is to return to the notion of the “new form of capital in its ecological phase” discussed in the previous chapter. In this new form of capital, nature is perceived as internal to capital. As part of the capital, natural resources should be sustained for future use, when, for example, advanced biotechnology will release the value that is yet to be discovered in the genes or chemical compounds of diverse biological species. Local inhabitants of the places where potentially valuable biological species exist, such as tropical forests, are also considered internal to capital so long as they effect the preservation of their environment. These people are appropriated as “stewards of biodiversity” within the discourses of biodiversity conservation and sustainable development. At the same time, they are woven into the web of power relationships that the discourses perpetuate. Bioprospecting rhetoric bases its arguments upon such discursive articulation of nature as a “reservoir of future value” and the appropriation of indigenous and local people as stewards of the reservoir.

Escobar (1995) insightfully suggests that this new form of capitalized nature not only relies on the symbolic conquest of nature and local communities (as “stewards” of nature), but also “requires the semiotic conquest of local knowledge, to the extent that saving nature demands the valuation of local knowledges of sustaining nature” (204). In other words, what is found useful in indigenous knowledge for either creating value from natural resources or sustaining the capitalized nature must be semiotically articulated as internal to capital. As described in this chapter, this process is accomplished through the various treatments that “indigenous knowledge” receives in the bioprospecting rhetoric. First, the content of indigenous knowledge is made available through recodification into scientific knowledge and placed within the hierarchy of scientific practices. That knowledge, and the possibility that it may contribute to new discovery, now becomes a commodity that can be bought or sold, the value of which is determined by the users of the knowledge rather than the originator. After being taken through the process of recodification, hierarchization, commodification, and devalorization, indigenous knowledge is virtually disempowered. Bioprospecting rhetoric succeeds in appropriating

indigenous knowledge as an object that is there to serve the needs of those interested in generating value from natural resources that are internalized in capital.

The concluding chapter will discuss ways in which resistance towards semiotic appropriation that leads to control can take place. Arun Agrawal (1995) suggests that *in situ* preservation of indigenous knowledge may provide leverage in the struggle for more autonomy, rights, and political power for indigenous people. He states that those interested in preserving the diversity of knowledge systems should attempt to “reorient and reverse state policies to permit members of threatened populations to determine their own future, thus facilitating *in situ* preservation of indigenous knowledge” (5, cited in Whitt 1998: 63). Local communities need to gain control over the use of the land and the resources in order for *in situ* preservation to succeed. Successful empowerment of local communities will coincide with the realization of the original value of indigenous knowledge in local settings, which tends to be lost in bioprospecting discussions. While material empowerment such as obtaining land rights is important for reclaiming the value of local knowledge, it is also critical to start developing an alternative or self-defined articulations of “indigenous knowledge” in order to struggle against the semiotic takeover. The concluding chapter examines some of these semiotic resistances as they have unfolded among several different indigenous populations.

## Chapter Four: Semiotic Resistances of Indigenous Peoples

### 4.0 Introduction

In the previous chapters, I examined the bioprospecting rhetoric's representations of the indigenous people. I focused on how this rhetoric constructs their identities and symbolizes their roles and knowledges. Bioprospecting rhetoric increases the profile of indigenous peoples by depicting them as economically underprivileged and holders of valuable ethnobotanical and ecological knowledges, thus making them crucial actors for biodiversity preservation. On the one hand, such a regime of representation, fostered by the rhetoric, is a manifestation of the dominant power's ability to frame, appropriate, and valorize indigenous people and their knowledge and to legitimize intervention in their affairs. Visibility can be a form of violence as the spectators cast their gazes at their subjects, categorize them, place them within certain coordinates of control, and disempower them by not allowing self-definitions. On the other hand, increased visibility can translate into an opportunity for the visualized people to resist misappropriation and to struggle for stronger footholds for both material and semiotic empowerment.

How can the space thus opened up be used for the struggle of indigenous people? In *Encountering Development*, Escobar maintains that resistance to the development discourse, which subjects local communities to being swept away by capitalism and homogenizing culture of modernity, must be locally based and be built upon social and cultural diversity. Semiotic resistance is particularly important for Escobar, since the dominant discourse constructs and defines the ways in which reality can be conceptualized. He urges that semiotic resistances require the imagining of alternative economic models and ways of being as well as an alternative regime of representation – identities that are self-defined, rather than defined by the mainstream discourse. Cultural differences, he believes, can be the basis for reimagining alternative economic models, modes of environmental management, and identities. Such alternatives may destabilize the domineering discourses and make room for the generation of a hybrid culture that combines traditional and modern cultures in a transformative manner (Escobar 1995).

It is no less important to strengthen the local people's material condition than to resist semiotic control. Capitalist regimes undermine the reproduction of socially valued

forms of identity and development projects destroy elements necessary for cultural affirmation by devaluing existing cultural practices (Escobar 1995). Therefore, “the struggle over representation and for cultural affirmation must be carried out in conjunction with the struggle against the exploitation and domination over the conditions of local, regional, national, and global political economics” (Escobar 1995: 171). In this concluding chapter, I examine four examples of indigenous people’s struggle over representation and cultural affirmation. I explore the various forms of semiotic resistances while keeping them in perspective with their material conditions and further implications.

#### 4.1 The Ayahuasca controversy: an explicit semiotic resistance

The protest in March 1999 by Amazonian medicine men against the patenting of their healing potion – Ayahuasca – presents an example of an explicit semiotic resistance. The shamans protesting against the patent acquired by American pharmacologist, Loren Miller, visited the US Patent and Trademark Office in suburban Washington in their traditional attire, and claimed rights to their cultural knowledge developed by their ancestors and passed down to them.<sup>40</sup> This exemplifies a resistance against the commodification of indigenous knowledge discussed in chapter three. When knowledge is commodified, it is (de)valorized in capitalist economic standards and results in the loss of control of the knowledge by its original holders. The Amazonians asserted their culturally unique values in an attempt to destabilize the western conception of intellectual property. They argued that the patenting and commercialization of Ayahuasca, one of their fundamental ingredients of religious ceremonies and healing, is a serious affront for over hundred cultures that populated the Amazon Basin.<sup>41</sup> In this particular case, the resistance was rooted in the presentation (and claimed priority) of alternative modes of being, reasoning, and also of an alternative economic model. However, it is interesting to note that the same protest relies upon their western lawyer’s argument that Miller’s patent is invalid because it was not a novel discovery – a case based on Western patenting rules.

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<sup>40</sup> <http://www.purefood.org/patent/amazon.cfm>

<sup>41</sup> Such statement was announced by the Co-ordination of Indigenous Organizations of the Amazon Basin (COICA). <http://www.biopark.org/biopirach1.html>

This incident is part of a struggle, which has developed into a larger political issue. Pressured by indigenous groups and environmentalists, the Ecuador congress in 1996 disavowed the patent agreement made three years earlier with the U.S. government. Same year, the Co-ordination of Indigenous Organizations of the Amazon Basin (COICA) denied access to indigenous territories by Loren Miller. In response, U.S. government's Inter American Foundation imposed material pressure by cutting off aid to the organization in 1998. The Ayahuasca controversy developed into antagonistic feelings against Western plant collectors in South America, resulting in more difficulties in arranging bioprospecting ventures to the area.<sup>42</sup> The semiotic resistance based on the reasoning of medicine men, who presented themselves in their traditional attire, therefore, is merely one manifestation of the political struggle over sovereignty, recognition, and self-determination by the indigenous people in the Amazon Basin.

#### 4.2 The Penan protest: environmental rhetoric and indigenous knowledge

Appealing to tradition, whether expressed by attire or beliefs, entails the danger of falling into essentializing or naturalizing tradition. At the same time, appealing to tradition can be an effective way to seek outside support. Brosius (1997) demonstrates how environmentalists protesting logging in Penan, Malaysia, have transformed ethnographic accounts of indigenous knowledge of landscape and the biotic elements in order to generate appealing images for environmental campaigns. From Brosius' perspective as an anthropologist who has studied the region, indigenous people possess knowledge of their environment that is at the same time rich and systemic and structural. For instance, the Penan people have certain ownership and usage rules for the management of forest resources that prevent over-harvesting and ensure their sustainability. Their knowledge of the landscape, which is a repository for the memory of past events, incorporates not only practical knowledge based on the complex network of rivers, but also detailed ecological knowledge as well. Brosius points out how environmentalists, appealing to the popular conception of forest dwellers as spiritually integrated with the mystical powers of the forest, provide a romanticized account of indigenous knowledge as wisdom

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<sup>42</sup> <http://www.purefood.org/patent/amazon.cfm>

and spiritual insight.<sup>43</sup> One virtue of romanticizing accounts is that they make indigenous knowledge narratable or “valuable” and available as a tool of persuasion. Brosius points out, however, the dangers of this approach. First, it imposes meanings on Penan “knowledge” that may be quite imaginary. Second, paradoxically, it transforms precisely the diversity that it is trying to advance into something generic. Environmentalists’ narratives, while trying to create transcendent value for the Western audience, transform indigenous knowledge to something that it is not. Brosius warns that such “obscurantist, essentializing discourse” may in fact “elide the substantive features” of indigenous knowledge. When bioprospecting rhetoric uses the notion of *stewardship*, it has the tendency not to define it in functional detail as would an ethnographer like Brosius, but to take for granted its existence and transcendent value created by environmentalists’ narratives.

The Penan protest is in fact known widely in international environmental circles. Resistance against commercial logging of the Borneo forest has taken many forms including blockade by indigenous dwellers whose livelihood depend upon the forest. The massive environmental destruction drew much attention from international environmental organizations and raised the visibility of indigenous people whose rights were being and are continuing to be violated. Material and technical support from environmental organizations have helped the local people with their struggle, and the visibility opened up more space for the people’s symbolic struggle. For instance, environmentalists have assisted indigenous people gain land rights by helping them construct maps for claiming community properties in court cases, some of which have recently yielded judgements in favor of the local communities over logging companies.<sup>44</sup> Traditional concepts of land and resource ownership differ greatly from the Western concept of property. Map making is an example of hybridization, in this case, of traditional property rights with Western instruments.

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<sup>43</sup> Brosius mainly cites *Penan: Voice for Borneo Rainforest* by ethnobotanist Wade Davis and environmental activist Thom Henley (Davis and Henley, 1990). They write, for instance, on resource management knowledge of the Penans: “If there is a pattern to the Penan migration, it is determined by the sacred growth cycle of the sago palm. It is a journey that may take twenty years to complete, an itinerary first described by the ancestors at a time when the earth was young and still wet with the innocence of birth” (106).

<sup>44</sup> Personal communication Judith Mayer

Brosius (1997) reports an “interesting consequences of the environmental rhetoric of medicinal plants” where “this rhetoric has itself suffused back to the Penan and been adopted by them as their own” (62). The author recollects that during the 1980s, Western Penan people rarely showed interest in medicinal plants. After the Western environmentalists began to frequent Penan, people started to decry the loss of medicinal plants. The loss of medicinal plants became the central element of their objection to logging. Brosius calls the phenomena “Plotkinization” of the discourse of indigenous knowledge of medicinal plants. Mark Plotkin, founder of Shaman Pharmaceuticals Inc., is one of the leading figures in developing an awareness of the depth of ethnobotanical knowledge of medicinal plants among indigenous people in Amazonia. It has become a standard practice in rainforest conservation rhetoric to refer to the depth of knowledge of medicinal plants of particular rainforest societies (Brosius 1997). According to Brosius, although the Penan people’s knowledge of medicinal plants has been portrayed as highly significant, it is much less encompassing than recent statements would lead one to expect. Brosius describes this interesting phenomenon as follows:

This is a kind of ethnographic hall of mirrors; drawing on rhetorics derived from an Amazonian context, environmentalists have brought assumptions derived from a familiarity with Plotkin’s work to Penan, who then repeat it back to other environmentalists, who take it as an exemplar of the depth of indigenous knowledge (Brosius 1997: 63).

In other words, the visibility of indigenous knowledge of medicinal plants raised by the efforts of ethnoscientists, such as those discussed in the previous chapter, has interestingly opened up an opportunity for the Penans to arm themselves discursively in ways not fully grounded in their actual knowledge.

#### 4.3 The Tiríos: indigenous knowledge and cultural identity

The Tirío tribe in the Suriname rainforest, according to Mark Plotkin (1993), is in fact capitalizing on their depth of knowledge on medicinal plants to regain cultural pride. In 1988, Plotkin presented the chief of the tribe all of the ethnobotanical information that he collected from his tribal medicine men. The chief was inspired to have Plotkin’s research translated into the tribal language. He also assigned two young apprentices to work with

older shamans to preserve traditional medicinal knowledge within the tribe. Six years earlier, when Plotkin started his work with the tribe, the chief showed no interest in local medicine because he regarded Western medicine as superior. Plotkin believes that his effort has helped validate the local culture in the eyes of the local people. Plotkin (1993) also reports on a similar shaman's apprenticeship effort sponsored by the NGO, Conservation International, which started in 1991 with the Bribri Indians in the village of Coroma, located in the foothills of the Talamanca Mountains of southern Costa Rica. Four shamans chose a class of four apprentices for a four-year training. "More importantly," writes Plotkin (1993), "this effort has sparked a whole cultural revival in the sense that customs that were being allowed or even encouraged to die out are now being revived" (288). The Bribri built a traditional thatched meeting house, the first ever seen by the youngest members of the tribe, who only knew the wooden houses in which they now live. Traditional dances once banned were again performed. Furthermore, neighboring Indian communities have been inspired by Coroma to take on similar approaches.

Escobar (1995) suggests that searching for self-defined representations based on cultural differences is key to semiotic resistance against dominant power that appropriate and manipulate their subjects through regimes of representation. In light of this argument, the Tiríos' and the Bribri's revaluations of their own cultures count as important exemplars of a way of countering the danger of being swept away by the wave of modernity that has been creeping into the remote communities.

#### 4.4 The Samoan efforts: material and semiotic empowerment

Resistances based on cultural affirmation against material pressure and imposition of outsider's appropriation encounter enormous challenges, however, when faced by latent unwillingness to consider indigenous paradigms from the inside out, rather than evaluating them in Western terms. Paul Alan Cox and Thomas Elmqvist (1993) report on the rainforest reserves in Western Samoa that are supposedly owned, controlled, and administered by the villagers. "While these reserves appear to be robust approaches to preserve establishment within the communal land tenure system of Samoa," write Cox and Elmqvist, "the concept of indigenous control appears to conflict with ecocolonialist

attitudes that disparage the traditional knowledge, culture, political systems, and integrity of indigenous peoples” (6). The authors describe two efforts to establish village controlled rainforest preserves in Samoa with support from Western donors, one of which turned into what he regards as ecocolonialism – the imposition of European conservation paradigms and power structure on indigenous villagers. The two cases present an epitome of the hopes and difficulties that lie ahead for local resistances. They also remind us of the two sides associated with visibility of the local people achieved by the environmental discourse. On the one hand, visibility opens up space for indigenous people to struggle for semiotic and material empowerment, while on the other hand, it subjects them to misappropriation, intervention, and control by outsiders.

The first effort took place in the village of Falealupo in Savaii, Western Samoa. In 1988, the village was in need of money to build a required school. Samoan villages are responsible for funding their own schools and hospitals. Since most Samoan villagers are subsistence farmers with little cash, they often as a last resort turn to allowing logging companies to cut down their forests for cash. Monetization of land and natural resources is often incompatible with the communal land tenure and resource management systems and is also destructive to local cultures (Cox and Elmqvist 1993: 7). In 1989, environmentally conscious overseas donors and the village signed the Falealupo covenant. The donors renounced any right or interest in the land and pledged to build the school in exchange of the village’s promise to continue to protect the forest and allow no logging for a 50-year period. Complete control and management authority of the forest preserve were maintained by the Falealupo chief’s council. This arrangement resulted in two schools, a small medical clinic, and improvements to the water system for the Falealupo village. It accomplished forest reserve management that is compatible with indigenous values, land tenure and resource management system, and economic model. Village controlled preserve also allows the maximization of the utilization of the rich knowledge they possess. Paul Alan Cox, who played a significant role in establishing the covenant describes it as a success, which engaged the villagers and Western interest group to work together in achieving the common goal of conservation and village progress.

Modeling on the Falealupo success, similar agreements aimed at forest preservation were initiated between a European NGO and three villages, Tafua being one of them.<sup>45</sup> The original idea of indigenous control of the project, however, was gradually eroded with the introduction of new funds amounting to \$800,000 USD from the Swedish International Development Agency (SIDA). SIDA's policy enforcement led to taking away the authority to control the allocation of the funds from the village chiefs and giving it to a new local NGO.<sup>46</sup> This change amounted to the denigration of indigenous knowledge, since the villagers could not control of the management of the preserve. Moreover, the NGO imposed their value systems on the Samoans, and attempted to change certain "objectionable" aspects of Samoan culture, such as "gender discrepancies in the village power structure as well as a perceived lack of democracy, in administration by the chiefs" (Cox and Elmqvist 1993: 10). The villagers found this to be a sign of disrespect of their culture. Furthermore, the village projects only received 34 percent of the SIDA funds, while 66 percent went to administrative expenses for the local NGO. The villages demanded equal partnership, but the NGO rejected the idea as "hand-out mentality" and claimed that the villages were only after money (ibid). Finally, the chief of Tafua village severed the relationship with the NGO by announcing in front of the Swedish national television that the village refuses to receive any funds or gifts from the NGO, but will continue to protect the forest nevertheless.

Originally conceived as empowering the local people to own, manage, administer, and control a rainforest reserve, the effort unwittingly turned into a significant cultural interference. Cox and Elmqvist lament that "the aftermath of the controversy demonstrates that although the ability of indigenous peoples to protect their rainforest is great, indigenous cultures are extremely vulnerable to erosion" (11). The authors report that the Tafua experience was so humiliating and insulting that other chiefs in Savaii are wary of involvement with any conservation organization. The Falealupo effort was indeed a success in both semiotic and material strengthening of the community, and it provides us with a sign of hope that alternative modes of economy, resource

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<sup>45</sup> Cox and Elmqvist (1993) do not name the European NGO, only refer to it as a major European NGO.

<sup>46</sup> Cox and Elmqvist (1993) refer to the local NGO as "a western-style organization operating from a different island, whose initial membership was drawn largely from the expatriate and western-educated residents of the capital city" (10).

management, self-identity, and earned respect may become the basis of struggle for indigenous people. Though the results were disappointing on the surface for the Tafua effort, it is nevertheless a case of strong resistance against intervention. In a sense, both cases fostered self-affirmation and self-definition.

#### 4.5 Conclusion: Local empowerment, semiotic resistance, and discursive resistance

Various discourses including human rights, environmental conservation, and bioprospecting refer to the benefits of indigenous peoples. Attention given to indigenous peoples open up spaces for them to have their voices heard. At the same time, these discourses have the tendency to define the roles and identities of indigenous peoples and determine the extent to which indigenous peoples share “common” objectives as the environmentalists, are vulnerable to state exploitation and oppression, and how valuable their knowledges are. Outside definitions become the basis for discursive and material interventions in local people’s affairs.

In all of the above four examples, indigenous peoples at one level or another struggle to defend their material conditions, demand recognition of their culture, resist being appropriated, interfered, or controlled, and strive for self-definition and self-affirmation. The four cases are distinctively different in terms of their strategies and outcomes. The amount of material support and/or pressure each community experiences also vary. In the Penan case, for instance, people adopt their constructed images as “stewards” to obtain the alliance of environmentalists to fight against the destruction and deprivation of their land. In the Tafua village case in Samoa, the local community resisted the roles imposed on them by outside supporters.

While strategies and results vary, four general principles seem to be implicit in all four local resistances. First of all, self-affirmation and cultural identity is fundamental to a local resistance. The tribes in Suriname referred to in Plotkin’s study took the first step by reviving the traditional ways. Secondly, indigenous people assert, in refusal of outside control, that there are alternative ways of being. This may be done symbolically by traditional attire and rituals or by presenting alternative models of economy, property rights, and environmental management. Thirdly, indigenous peoples can utilize the spaces opened up for them by their heightened profile to get their voices heard. In the

case of the Penans, the people took advantage of the rhetoric that heightened their visibility and recycled it. In the case of Tafua, the village chief appeared in the Swedish national television to insist on his people's self-determination. Lastly, indigenous peoples are assisted by outside material and/or ideological support provided by those who share interests with the people. Such assistance in the Penan's case resulted in an effective hybridization of mapping techniques and traditional notion of community resources. The village of Falealupo received both material support and respect for local autonomy, while Tafua was only granted material support, which led to the indigenous people's refusal of outside intervention.

What then appear to be important are not only that these local semiotic and material resistances take place, but also for an overarching discursive resistance to come into place and strongly side with indigenous people's culture, self-determination, and rights. With the UN International Decade of the World's Indigenous People is underway lasting until the year 2004, the indigenous peoples' awareness is likely to be heightened and their voices raised louder. Ideally, all of these movements will amount to a critical deconstruction of the dominant discourse and empowerment of the indigenous peoples.

## Conclusion

In this thesis, I drew three major conclusions about the rhetoric of bioprospecting. In chapter one, I emphasized the power relationships and norms underlying the bioprospecting rhetoric and concluded that despite its emphasis on “equitable benefit sharing,” bioprospecting proposals promote the interests of politically and economically powerful players. Bioprospecting proposals often articulate themselves as a “win-win-win” project, in which all participants benefit equitably. However, my analysis shows that a better way to describe the proposals is as constructed by weaving the interests of the multiple stakeholders, who back up their arguments with the support of dominant discourses. In particular, by borrowing from the rhetoric of development and sustainable development, bioprospecting proposals ensure that they also inherit the norms and power relationships underlying these discourses. I also demonstrate that the compensations offered by powerful bioprospectors to source country partners reflect the unequal power relationships by showing that equitability is defined through the eyes of the providers, but not the recipients.

Secondly I argued that *stewardship* is a role assigned to indigenous people so that they can be mobilized and appropriated through the rhetoric of bioprospecting in order to make certain arguments. Chapter two made the case that there is a tendency to lean towards emphasizing conservation rather than equity when discussing compensation for the local population. By articulating indigenous people as *stewards* of the environment, those who deploy the conventional rhetoric of bioprospecting are able to argue that indigenous people who participate in the bioprospecting effort receive sufficient and appropriate compensation when they are provided with support for biodiversity conservation efforts. As a result, indigenous people are forced into a role that is not self-defined, but rather is imposed on them by others.

Thirdly I demonstrate that bioprospecting projects take indigenous knowledge of medicinal plants out of its original context, recodify it into scientific information, and treat it as a commodity with relatively little value. Chapter three traces the transformation of the significance of indigenous knowledge of medicinal plants from its original socio-cultural context through the drug development process. My observation confirms Escobar (1995)’s suggestion that local knowledge is “seen as something that

exists in the ‘minds’ of individual persons about external ‘objects’, the medical or economic ‘utility’ of which their bearers are supposed to ‘transmit’ to the modern experts” (204) rather than a complex cultural construction.<sup>47</sup> Furthermore, the notion of indigenous medicinal knowledge is circulated within the bioprospecting rhetoric sometimes as “valuable” and at other times as less so, depending on the interests of those who deploy the rhetoric. The study shows that contrary to the expectation that utility of indigenous knowledge increases its value as a commodity, commodification makes indigenous knowledge susceptible to appropriation and (de)valorization.

The findings of chapters two and three are tied together by the concept of ecological form of capital, according to which nature is a reservoir of future values. Under this concept, factors that foster biodiversity conservation – in particular, local inhabitants and their knowledge of sustainable use of natural resources – become economically important. As I stated in my introduction, Escobar (1995) suggested that this new capitalization of nature “does not only rely on the semiotic conquest of territories...and communities (as ‘stewards’ of nature); it also requires the semiotic conquest of local knowledges” (204).<sup>48</sup> This thesis demonstrates that Escobar’s assertion holds true in pharmaceutical bioprospecting. Bioprospecting proposals rhetorically control indigenous peoples and their knowledges, the former as *stewards* of biodiversity and the latter as commodity, in support of the capitalized nature.

The final chapter is based on my conviction that indigenous people are subjected to discursive control and that such semiotic control must be resisted not merely by providing them with material support, but also *semiotically*. This chapter aims at shedding some positive light on this aspect by showing that indigenous peoples have taken advantage of the spaces that have been opened up for them through their heightened visibilities. Self-constructed identities based on local cultural differences have been a key element in these local resistances against universalized system of misappropriation. Ideally, however, these local resistances would be supported by discursive resistance, which elevates indigenous viewpoints ideologically to place them on an equal footing with the dominant discourse.

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<sup>47</sup> This statement was quoted in full in my introduction, pages 2-3.

<sup>48</sup> *ibid.*

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