

**THE COMMUNITY RESOURCE REGISTRY:
A MECHANISM FOR THE PROTECTION OF
INDIGENOUS AND LOCAL KNOWLEDGE**

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Abstract

This thesis examines the role of the 'Community Resource Registry' as a mechanism for the protection of indigenous and local knowledge. The Registry, for short, will refer to the processes by which indigenous and local communities in various parts of the world, are documenting their knowledge as an intellectual and/or non-intellectual property right mechanism. Although the preservation and promotion of knowledge may be sought, the Registry specifically is being undertaken in order to sustain claims over knowledge.

Through an analysis of the existing literature related to the Registry, and a 6 week exploratory research trip to Ecuador, it will be demonstrated, that due to various technical and ideological concerns, the Registry may not be an effective mechanism for indigenous and local knowledge protection in and of itself. If appropriate mechanisms for such protection are to be considered, research needs to reflect indigenous and local visions for such a system.

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Figure 1: Non-Indigenous vs. Indigenous Knowledge

Table 1: Incentive Matrix

Acronyms

AE	Accion Ecologica
BMS	Bristol-Myers Squibb
Bt	<i>Bacillus thuringiensis</i>
CBD	Convention on Biological Diversity
CBR	Community Biodiversity Register
CEDA	Centro Ecuatoriano de Derecho Ambiental
CEPCU	Centro de Estudios Pluriculturales
CIMMYT	International Centre for the Improvement of Maize and Wheat
CIR	Community Intellectual Right
CoFaB	Convention of Farmers and Breeders
COICA	Coordinadora de las Organizaciones Indigenas de la Cuenca Amazonica
DIAND	Department of Indian and Northern Development in Canada
DNA	Deoxyribonucleic Acid
DUS	Distinct, Uniform and Stable
EPA	Environmental Protection Agency of the USA
FAO	Food and Agriculture Organization of the United Nations
FDA	Food and Drug Administration of the USA
FHC	Forest Healing Conservancy of Shaman Pharmaceuticals
FRLHT	Foundation for the Revitalization of Local Health Traditions in India
GATT	General Agreement on Trade and Tariffs
GIAN	Gujurat Grassroots Innovations Augmentation Network
GIS	Geographic Information Systems
GMO	Genetically Modified Organism
GNP	Gross National Product
GR	Green Revolution
HYV	High Yielding Variety
IARC	International Agriculture Research Centres
ICBG	International Cooperative Biodiversity Groups Program
ICM	Integrated Crop Management
IDRC	International Development Research Centre
ILO	International Labour Organization
ILSA	Instituto Latinoamericano de Servicios Legales Alternativos
IP	Intellectual Property
IPBN	Indigenous People's Biodiversity Network
IPR	Intellectual Property Right
IQBSS	Quichua Biotechnology Institute 'Sacha Supai'
IRRI	Institute for Rice Research International
IU	International Undertaking
IUCN	International Union for the Conservation of Nature
IUPGR	International Undertaking for Plant Genetic Resources
I&L	Indigenous and Local
I&LK	Indigenous and Local Knowledge
NCI	National Cancer Institute

OECD	Organization for Economic Cooperation and Development
OPIP	Organización de Puyo de las Indigenas de Pastaza
PBR	People's Biodiversity Register
PBR	Plant Breeder's Right
PIC	Prior Informed Consent
PLA	Participatory Learning and Action
PRA	Participatory Rapid/Rural Appraisal
PVP	Plant Variety Protection
RAFI	Rural Advancement Foundation International
RBR	Rights to the Benefits of Research
ROI	Registry of Invention
SUBIR	Proyecto Uso Sostenible de los Recursos Biologicos
TK	Traditional Knowledge
TNC	Trans National Corporation
TRIPs	Trade Related Aspects of Intelletual Property Rights
TRR	Traditional Resource Rights
TWN	Third World Network
UN	United Nations
UNCED	United Nations Conference on the Environment and Development
UNCONIAE-C	Union de Organizaciones y Comunidades de Anyachaya la Esperanza y Caranqui
UNDP	United Nations Development Program
UPOV	Union for the Protection of New Plant Varieties
USDA	United States Department of Agriculture
USPTO	United States Patent and Trademark Office
WIPO	World Intellectual Property Organization

Chapter 1

Introduction and Thesis Statement

Men's fears, solitudes, cares, labors and watchings, would all perish in the same moment with the value of money: even poverty itself, for the relief of which money seems most necessary, would fall. But, in order to the apprehending this aright, take one instance. Consider any year that has been so unfruitful that many thousands have died of hunger; and yet if at the end of the year a survey was made of the granaries of all the rich men that have hoarded up the corn, it would be found that there was enough among them to have prevented all that consumption of men that perished in misery...(More, 1901:97).

A Utopia as imagined by Francis Bacon in his book the 'New Atlantis' written in 1626, brings to life the author's ideal new world as embodied in the scientific civilizing rationale. Bacon drew upon the Utopia as an imagined perfect place or state of things that was originally expressed by Sir Thomas More in 1516. Bacon's Utopia, like More's put into motion (in the Socratic sense), an ideal common wealth. For Bacon, this described a period in scientific and technological development when all biological forms would serve as the raw materials for the refashioning of a new biota. He prophesied designer plants that would produce clothing, fruit and vegetables with new tastes, and grains that would provide all nutritional requirements. His Utopia, realized through experimental science, would in fact allow humans to achieve a deeper understanding and connection with God. The period of such Utopic writings was marked by Columbus's discovery and reflected a conception of a world in which the imaginations of 'men' were stirred by its sudden enlargement. For Bacon, as his masterful island leader, Salomon explains: "The end of our foundation is the knowledge of causes, and secret motions of things; and the enlarging of the bounds of human empire, to the effecting of all things possible" (Bacon, 1901:129). The highly advanced society that Bacon envisioned represented an organic alternative to the mechanic industrial island state upon which he lived.

Some four hundred years later, transformations in biotechnology and genetic engineering are prophetically being heralded as an alternative to a global dilemma that has resulted from the continued expansion of the 'western' model of world development. Modern biotechnology

innovations have already largely expanded 'man's' conception of the contemporary world, changing the ways in which the earth and its natural resources are perceived. It is claimed that various biotechnology innovations can contribute to global 'security' by expanding the potential for meeting the world's increasing demands for food and pharmaceuticals in an environmentally responsible way. Although the possible benefits that such technology could bring to the improvement of human well-being, may be real, they also represent a bundle of interwoven factors. Among other elements, the current discourse with regards to contemporary biological innovations has emerged around the tension between the benefits such innovations can provide on the one hand, and the threats the continued use of indigenous and local knowledge pose to the other. Contesting claims from indigenous and local and various civil society actors, have revealed that some communities are in fact involved in what will be referred to as the Community Resource Registry, various locally based strategies, being undertaken as a means by which to counter the continued misappropriation of indigenous and local knowledge and subsequent threats to their survival.

Indeed while the debate around acts of biopiracy, as private and public sector groups pursue their explorations into new microbial territories, have largely contributed to the emergence of various principles and obligations arising from contesting declarations and conventions, a parallel gap has emerged between the ideals as held within newly formulated model laws and concepts, and the means by which these ideals can be achieved. The Registry has arisen as a possible associated mechanism for the enabling of such varied alternative proposals.

However debate is also occurring around the actual science of biotechnology, including the threat that modern breeding techniques pose to the biological diversity of the earth and issues of ownership and control of 'new' life forms as a result of the increasing trend towards the commercialization of the life sciences into life industries and shifts towards a 'freer' international

trading environment. Hence the Community Resource Registry is also representative of various conceived tools that not only seek to provide intellectual property right protection, but also function as a non-intellectual property tool for the promotion and continued use of indigenous and local knowledge.

I would posit that what is central to these debates surrounding indigenous and local knowledge protection, is that such technical, legal and political mechanisms, function as spatial strategies in communicating 'control' and ownership over newly classified areas. However, although it would appear that the concerns of indigenous and local communities, as articulated in the Registry, are representative of the construction of alternative paradigms that confront these 'life industries', an emerging gap highlights the ambiguity between the assertion that Registration will protect indigenous and local knowledge on the one hand, and the manner in which this is to be achieved. This ambiguity raises the question as to how the Registry will function or be operationalized with regards to the protection of indigenous and local knowledge. As will be argued in this thesis, due to various technical concerns, the newly evolving strategies as embodied in the Community Resource Registry, may not only be ineffective for the protection of indigenous and local knowledge in and of itself, but from an ideological stance may do little to contribute to a shift from a strategic to an ontological approach to understanding contemporary geographic imaginaries¹.

1.1 The Community Resource Registry

In the month of June 1996, several hundred villagers from the Malla Village Panchayat in Karnataka State, India, embarked on a Biodiversity Conservation Prioritization Project. This

¹ Geographic imaginary in this sense, draws upon the notion, as developed by Michael Shapiro, of the way in which collectivities locate themselves in the world as a territorial elaboration of self and Other (1997). This term may not be unlike the notion of mental mapping.

grass roots, participatory process brought the Malla village members into a discussion that allowed them to explore conflicts and consensus in various strata of society regarding biological diversity. With the facilitation of a project team, the community members, through interviews, discussion groups and participatory activities, documented their knowledge and understanding of the history of their natural resources, the uses of resources by various sectors of society and developed a strategy and management plan for the sustainable use of their biological diversity. Information regarding the landscape and peoplescope (including: a village profile, various major resource user groups (internal and external), gender, age and knowledgeable user groups, land use patterns, settlement, ownership and their social values) and the prioritization of a list of all biological resources (plant, animal and other) known by community members. An ecological and conflict history of the region was explored that allowed the community to develop a conservation strategy and as a basis for sustaining claims over the knowledge. All of this information was documented in a record, a copy of which is now held by the community and in the Grama Panchayat or Regional Office (Achar, 1997).

The description above is representative of numerous activities occurring in India and throughout the world, whereby indigenous and local communities have become actively engaged in the documentation of their knowledge. While in India this process has come to be known widely as the Community Biodiversity Registry or CBR, this terminology does not clearly reflect the scope and nature of knowledge registration beyond biological diversity. Hence for the purposes of this thesis, the process will be referred to as the Community Resource Registry or Registry for short. The Registry has to date been a loosely defined term referring broadly to the processes by which communities seek to 'protect' resources and associated knowledge through some method of documentation. Although 'documentation' is not a necessarily contemporary phenomena per se (many societies have historically documented their knowledge in various

manners), the Registry has more recently arisen out of community concerns for diminishing biological and cultural diversity and the increasing prevalence of bioprospecting activities. To date there has been no comprehensive study of the extent of Registries. However a preliminary inquiry demonstrates that although registration activities are taking place in various parts of the world to ensure intellectual property right and non-intellectual property right protection, the Registry is specifically being undertaken as an assertion of rights over knowledge, or as a counter-IPR tool, that inhibits others from attaining such rights.

1.2 *Non-Intellectual and Intellectual Property Right Protection*

The Registry it is argued, may be able to provide non-intellectual property and/or intellectual property protection for indigenous and local knowledge (Crucible, Forthcoming). Such categories however, clearly do not reflect easily distinguishable groupings, they refer more to a continuum of possible protection mechanisms.

Intellectual property protection is described by the Crucible II² as “...the rights of control, vested in ‘owners,’ based on the recognition of some privileged connection between those owners and the knowledge itself” (Vol. 2, Forthcoming). With respect to existing mechanisms, intellectual property (IP), in the case of patents and plant variety protection, for example, can refer to the limited monopoly rights bestowed upon an individual or corporate knowledge holder, for the full disclosure of that knowledge. It also includes the rights of control where knowledge

² In the spirit of the Crucible I, the second phase of the Crucible Project brought together individuals from various sectors (academic, research, corporate and government) from around the world to discuss issues related to the conservation, ownership and flows of information and plant germplasm. Book 1 of Crucible II is in fact a continuation of *People, Plants and Patents* which updates and explores these issues, offering view points on some of the more difficult and contentious topics. Book II however attempts to lay out some of the possible legislative options (both conventional and *sui generis*) for national governments grappling with 1 the conservation and exchange of germplasm, 2 the ‘protection’ of indigenous and local knowledge and 3 the continued promotion of biological innovations. Although the various parties involved in the Crucible, disagree on many issues, they have largely advanced this discussion through a process that is committed to reaching consensual agreements.

has not been disclosed, such as copyright and trademark and can last indefinitely in the case of the latter. The nature of the rights vested in the owner can also differ from exclusive rights, to inhibit outsiders from use, or restrictive rights, that mitigate its use through royalties, attributions etc.

The creation of *sui generis*³ IP protection with regards to indigenous and local knowledge, refers to the creation of IP rights of control where there were none before. This kind of IP protection is reflective of a possible alternative or unique mechanism that would provide different IPRs for different kinds of knowledge, given that the appropriate legislation is passed to support these rights. Plant Variety Protection is an example of *sui generis* IP law, in that it is a derivative of, but different from patent law. Proposals for collective intellectual property rights as put forth by Crucible I, refer to the creation of a new kind of intellectual property right for informal plant breeder's innovations (1994). The options for *sui generis* IP laws for indigenous and local knowledge, explored in Crucible II, outline the possible ways in which such protection would look, highlighting the importance and difficulty of precisely defining "...what aspects of indigenous and local knowledge can be made subject to intellectual property laws and under what circumstances" (Forthcoming).

It is important to note that the terminology: 'intellectual property right', perhaps inaccurately reflects the notion that it is the intellectual property or knowledge that is being protected. While IPRs may provide protection for knowledge (ie. from its disappearance), it is in actual fact, the knowledge holder or innovators rights over that knowledge that is being protected. Another important distinction to be made, is that IP (particularly in the case of indigenous and local knowledge protection) is often used to invoke the notion of some form of *natural right* over 'one's' knowledge.

³ Latin for of its own kind or unique.

Intellectual property rights as a kind of inherent or *natural right* refers to the notion that individuals have a natural property right to their own ideas which society is morally obliged to recognize.⁴ However it has been argued that the natural right notion has been largely eclipsed through the development of the above listed contingencies (who can claim rights, whether the invention is judged to be useful, non-obvious and novel and the time limitations) (Brush, 1994; Vaver, 1997). Hence it is the *economic benefits* argument or utility that has become the driving rationale for IPRs as a legal mechanism.⁵ Be this as it may, much of the literature regarding indigenous and local knowledge, still refers to the natural rights notion of IPRs. Hence statements such as: “Farmers’ intellectual property rights to grow and to control their remaining folk variety seeds and food products is increasingly threatened...”(Soleri, 1994), allude to some kind of inherent or natural intellectual property right that the farmers possess. While they may possess ‘rights’ such as human rights, to grow their own folk varieties, it is not their intellectual property right to do so. For the purposes of this paper, intellectual property right will refer to the positive assertion of rights over knowledge. In the case of *sui generis* IP, the creation of an alternative but possibly derived IP law, will be implied. Finally, other non-IP or counter IP means by which communities seek to inhibit outsiders from attaining IP rights over their knowledge will be described as such.

The somewhat vague and amorphous term: non-intellectual property protection, in fact suffers from being so broad a term as to describe nothing at all. However, it is perhaps a necessary term when one wishes to describe all other mechanisms that do not provide exclusive rights of control, vested in owners of the knowledge in question. Non-intellectual property refers to all rights, such as territorial rights, property rights, human rights etc., and activities such as

⁴ As Stephen Brush points out, it is in fact this notion, along with the concurrent notion that furthermore, justice requires that individuals who provide knowledge be compensated for their service (as labour deserves compensation) that upholds the current legal intellectual property right system.

⁵ Vaver, however, goes on to argue that the utility argument may not be an entirely supportive approach in and of itself.

conservation, environmental planning, community planning to name a few, that indirectly or directly protect, enhance, promote, preserve and use indigenous and local knowledge.⁶

Non-intellectual property mechanisms may not necessarily inhibit third party IP claims, for indigenous and local knowledge, (they may in fact diminish indigenous and local control over knowledge), but are a reminder with regards to "...genetic resources, biological diversity, and/or indigenous and local people's rights, ...that there are other, albeit less attractively controversial, potentially more effective means of promoting, protecting, using, respecting etc., indigenous and local knowledge" (Crucible II, Forthcoming). While a range of possible supporting policies regarding cultural survival, participation in decision making and research, technology transfers, and non-proprietary rewards for innovation, to name a few, could support non-intellectual property right protection, it is the recognition that the survival of indigenous and local knowledge depends on the survival of their cultures, has been greatly reflected in policy formulation (CBD, 1992; Crucible II).⁷ One of the mechanisms, put forward for achieving this, is the Registry.

The Crucible II for example, has specifically recommended that: "Governments should provide financial and technical support to communities that are interested in creating their own registries. Technical support should include integrating the community registry into the national patent, copyright, trademark and design searches for prior art by the relevant government agencies involved in examining claims for intellectual property rights. If necessary, national legislation should be amended to guarantee the inclusion of the community registries in these searches" (Forthcoming). The Registration is also outlined as one possible associated mechanism for the IP protection of indigenous and local knowledge. Hence, two questions arise: What

⁶ Non-intellectual property protection in this sense, includes non-intellectual, non-property protection such as human rights.

⁷ The Crucible group recommends that "Government must realize the disappearance of indigenous and local cultures and peoples is the biggest single threat to indigenous and local knowledge. National governments should therefore work to remove threats to the survival of the indigenous and local peoples that exist within their borders" (Forthcoming).

constitutes a Registry? And how would the documentation of indigenous and local knowledge enable these assertions?

1.3 The Registry and Non-Intellectual Property Protection

To begin with, one could argue that any initiative that documents knowledge, may in some way be engaging in a non-intellectual property right protection strategy. This characteristic however, would not necessarily, imply that it was also a Registry. Many endeavours such as various *in-situ* conservation strategies involving the documentation of knowledge in resource inventories, ethnobotanical journals, community mapping, cookbooks, herbal medical books, journals, the advent of Geographic Information Systems initiatives, the Indigenous Peoples Biodiversity Network (IPBN), and the more recent proposal for the world's largest registry to be launched under the aegis of the Global Biodiversity Information Facility that "...scientists hope will...become the single database that pools all the recorded but widely scattered data about the earth's animals, plants and microorganisms...to be made accessible via the Internet" (New York Times: July 27, 1999) are all representative of ongoing processes of resource documentation. Although the intent of these projects and the manner in which they are undertaken (top down vs. bottom up) differ, they may facilitate some manner of non-intellectual property protection (Denniston, 1994; Gonzalez, 1999; Harmsworth, 1998). They, like the Registry, can be a central part of a community's consciousness and conservation strategy and can assist in environmental and community planning, including the development of research protocols and 'downstream' development strategies (Crucible, Forthcoming).

With regards to living organisms, documentation may also take other forms. For example, while the initiatives above, clearly are codifying their knowledge into written language or computer databases, how would this be any different from any other activity that 'documented' knowledge through its continued use. For example gardening and or cooking

could easily constitute a different kind of documentation. Given these broad criteria, various endeavours, from botanical gardens, national herbariums, seed banks, national parks, just about any documentation project could conceivably fall within the realm of a 'decentralized and public registry', depending of course, on how one defined the notions of 'community, and 'resource'. Likewise, the numerous private collections and acquisitions in various forms, even including such databases as held by the Merck/Inbio collection in Costa Rica, and the restricted information that is certainly apart of the seemingly 'public and decentralized' initiatives above, all could fall within the guise of a centralized and private registry.

While the range of all possible non-intellectual property right initiatives is seemingly endless, several endeavours specifically identify themselves as Registries. The examples of the Registry of Invention and the Community Biodiversity Registry, both in India, and the Knowledge Cartel Project in Ecuador, which will be explored in greater detail in Chapter 5, also seek non-intellectual property right protection.

In India, for example, the Srusstigyan Manual, arising out of the first workshop, held in 1994, on Registries, outlines 3 primary non-intellectual property reasons for the registration of knowledge. The first 2 reasons refer to the Registry as a mechanism for community resource management and planning and conservation. The Registry it is felt will lead to the '...creation of a mechanism for monitoring the current use and existing local knowledge about a variety of biodiversity resources, be it medicinal plants, land races (folk varieties) of crops, wild relatives of cultivated plants and other bulk-use resources like fuel wood and fodder species. Such information could then become the basis of a strategy for conservation of these resources" (Seshagiri, et.al., 1994:1). Furthermore it "...could become a tool for local management of bio-resources by the local communities themselves" (Seshagiri, et.al., 1994:1), to control its sustainable use directly and to facilitate negotiations with interested stakeholders.

Likewise Ashish Kothari and Sarika Bhatia in an article entitled: “Community Register for Documenting Local Community Uses of Biological Diversity” that appeared in the Spring 1996 Issue of the *Bulletin of the Working Group on Traditional Resource Rights* lists the multiple aims of the Registry for the revitalizing, recognizing and sharing of traditional knowledge, skills and techniques, while also setting priorities for its conservation and usage (1996:10). Utkarsh Ghate at the Centre for Participatory Management of Biodiversity at the Foundation for the Revitalization of Local Health Traditions (FRLHT) in India points to the Registry “...as a tool to document, monitor and provide information for sustainable management of local biodiversity resources, and b) as a tool to promote biodiversity-friendly development in the emerging process for decentralized management of natural resources...” (Amruth, 1996:3). The Registry as a non-intellectual property right tool, it is asserted, will ‘protect’ indigenous and local knowledge through the promotion of its continued use both locally and more widely. These initiatives, however, unlike the non-Registry endeavours outlined above, have the particular aim of inhibiting subsequent outside party IP claims.

1.4 The Registry and the Establishment of Claims Over Knowledge

One of the specific aims of the Registry is to ‘protect’ indigenous and local knowledge from outside interested parties. In this sense, the Registry functions as an assertion of indigenous and local control over intellectual and cultural property, or an inhibitor of such claims. It is in fact this particular emphasis, that separates the Registry from other kinds of ‘documentation’ projects as outlined above. The Registry not only aims to attain these non-intellectual property goals, but it also aims to protect indigenous and local community knowledge from bioprospectors through the use of existing intellectual property mechanisms or through counter-IP mechanisms that may be associated with a *sui generis* intellectual property system. The cases considered in this thesis for example draw upon various intellectual property

mechanisms such as the tradeseecret in the case of the Knowledge Cartel in Ecuador (Vogel, 1997) and *sui generis* IP assertions such as Plant Breeders Rights in the case of the Registry of Invention in India (Gupta, 1998). However, the Registry of Invention, not unlike the Community Biodiversity Registry initiatives in India, seek some kind of alternative intellectual property right protection, beyond that of existing IP mechanisms, such as the *sui generis* Plant Variety Protection, that better represents the 'nature' of indigenous and local knowledge (COICA, 1999; Gupta, 1998; Posey, 1996; Simpson, 1997). The Registry may also function as an interim strategy until reforms are made that reflect for example a collective intellectual rights mechanism (Glowka, 1998). As such, defensive publication as put forth by the CBR initiatives is being used as a sort of interim non-intellectual property-intellectual property mechanism. While all Registry activities aim to provide some form of IP protection, including *sui generis* IP protection, they may also provide non-intellectual property protection.

The Registry has received increasing attention as one part of a possible *sui generis* IP law, not only from indigenous and local communities in various parts of the world, but from policy makers as well. From this perspective the Registry is not merely representative of isolated events at the local level, but exists within a rapidly evolving context in the fields of intellectual property rights, free trade and genetic diversity. Much of the existing literature on Registries however, points to documentation as an intellectual property protection mechanism in and of itself, without clearly indicating how documentation will create a positive assertion. For example Honey Bee network newsletter of SRISTI in India, states that "...every innovation must be sourced to individual/communities with name and address to protect the intellectual property rights of the people" (1999:18). Such statements highlight the ambiguity arising out of how the documentation of knowledge in a Registry will actually function or be operationalized with regards to the protection of that knowledge. Hence a gap emerges, between the assertion that the

Registry will protect indigenous and local community ‘intellectual property’ on the one hand, and the manner in which this will be achieved on the other.

Before plunging into an examination of these various ambiguities and concerns, it would be useful to first situate the Registry within the various scientific and policy developments that have contributed to the ‘need’ to protect indigenous and local knowledge in the first place. In Chapters 2, this thesis will explore some of the recent developments in the biotechnology industry and various concerns regarding the globalization of IP through international trade agreements such as the World Trade Organization. Chapter 3 will explore some of the issues surrounding the recent trends in bioprospecting, before moving on in Chapter 4 to highlight some of the resulting discussions, venues and proposals for the protection of indigenous and local knowledge, from which the Registry has emerged. Chapter 5 will explore various Registry initiatives before engaging in an examination of an Ecuadorian case study, based on my 6 week field trip to Ecuador in Chapter 6.

Chapter 2 ***Towards a Materialist Alternative***

By the year 2020, the global population is expected to increase by more than 40 percent, possibly surpassing the 8 billion mark, these additional billions, with a limited supply of suitable farmland, poses a dilemma of immense proportions. One answer may lie in agriculture biotechnology, which makes agricultural production more efficient (Monsanto, 1998).

The inextricable link of humans to the natural world has recently come into focus for the North, as the implications of various anthropogenic activities raise environmental and other concerns. Many of these implications assessed in the Brundtland Report, *Our Common Future* in 1987 exposed wide ranging issues revolving around the threat of 'underdevelopment' and environmental degradation that indicated a necessary transition towards what the report called a more 'sustainable' kind of development. Concerns regarding the growing number of people inhabiting the globe and the increasing disparities between the rich and the poor have clearly continued into the beginning of the 21st century (OECD, 1995). For the South, such concerns along with burgeoning debts, falling commodity prices and continued barriers to international trade, present serious problems for sustainable development. In particular, the increasing demands for foods and the concerns surrounding conventional industrial processes have continued in renewed debates regarding the 'ultimate carrying capacity' of the Earth's land and water resources. Echoes of Malthusian assertions that population growth constitutes the gravest threat to our planet and to our collective ability to survive, have gained currency as projections indicate a necessary doubling of global food supplies by the year 2025, if the world is to provide adequate diets for the estimated 8.5 billion people that will inhabit it (FAO, 1998). Clearly the concerns of an increasing global population could pose a serious threat to global security. Recent biotechnological innovations it is being put forth, may be the solution to this dilemma.

2.1 *The Solutions of Biotechnology*****

Modern biotechnology can be understood as a continuum of technologies that use living organisms or substances from living organisms to make or modify a product to improve a plant or animal. As Gabrielle Persley describes in *Beyond Mendel's Garden: Biotechnology in the Service of World Agriculture*: “Biotechnology is comprised of a continuum of technologies, ranging from long-established , and widely used technologies, which are based on the commercial use of microbes and other living organisms, through to the more strategic research on genetic engineering of plants and animals” (Persley, 1990:1). What is exceptional about the modern end of the spectrum, is the shift away from the use of whole organisms (for example farmers breeding their livestock or plants) to parts of those organisms (characterized by the transfer of DNA, cells, tissue and so forth). This entails crossing over what has been considered the natural boundaries of species into the realm of transgenic species.

Since Gregor Mendel, the father of genetics, and Charles Darwin’s theory of evolution it has been commonly held that the evolutionary passage of gene’s messages would and could travel through groups of individual organisms that belong to the same species and that are capable of interbreeding. Mendel had in fact demonstrated what is called the primary source of variability in plants and animals on which the Darwinian notion of natural selection could then operate (Darwin, 1985). Contemporary biotechnology involving the transfer of genes from one species to another does exactly what Mendel and Darwin would have thought impossible. Some would argue that genetic engineering is a revolutionary step for humanity (Hoescht, 1997). It is seen as revolutionary in that it defies the natural pace of evolutionary change. That which would have taken years to produce through conventional breeding is achieved in a single moment. These innovations, may provide solutions to the various concerns regarding the earth’s natural resources.

Transgenesis holds great promises for producing genetic improvements in living organisms. The possibilities for enhanced growth, increased production efficiency, disease

resistance and expanded ecological ranges have in many cases already been realized. Several examples of products that are currently in use in various parts of the world are herbicide and pesticide resistant strains of cotton, maize, rice and rape seed that reduces the amount of chemical and mechanical input conventionally¹ required. Such varieties are also considered to be stronger and better. Currently under study is a fast growing, freeze and disease resistant transgenic fish variety which could be the first marketable transgenic animal available for human consumption. By using growth hormones, transgenic fish can grow up to 30 times larger than the original species (*Chemistry & Industry*, 1997: 311). Such innovations directly respond to increasing demands for food and recent health and environmental concerns with chemical applications. Environmental biotechnology is also under research in response to various environmentally damaging anthropogenic activities. For example Phenol-degrading microbes have been applied to reduce pollution and to help clean up oil spills such as the Exxon Valdez tanker off the coast of Alaska in 1989 (*Grace, E.S.*, 1997). Although the examples of recent biotechnology innovations from which to draw upon are numerous, one agriculture biotechnology solution, that has arisen in response to increasing demands for food and the greening of technology will be briefly highlighted. Examples from the agriculture industry will not only allow for a deeper analysis of the processes involved in transgenesis, but will also provide for a broader conceptualization of the influences and impacts in shifts from conventional to modern agrarian practices. The latter having arisen at one level, out of the problems and concerns with conventional farming methods.

2.1.1 Towards a New Organic Alternative

Modern agriculture biotechnology such as herbicide and pesticide resistant plants have increasingly displaced conventional varieties that require higher levels of chemical and industrial input. Green Revolution technology as it has been termed, in many ways responded to the

¹ Conventional farming in this case refers to the agricultural activities requiring capital intensive inputs such as fertilizers, herbicides, machinery and the monocropping of high yielding seed varieties.

concerns of food security in the South by greatly augmenting the yields of rice and wheat crops. Through the development of early maturing, semi-dwarf, fertilizer responsive varieties of rice and wheat, research institutes such as IRRI (Institute for Rice Research International) in the Philippines were able to double or sometimes triple grain production per acre per season within a 20 to 30 year time span, beginning in the 1950's. While this in fact has enabled global food production to outpace global population growth (Tilley, & Oberdiek, 1995; Goodman, 1987), it was not without its costs. The conventional farming model has clearly had detrimental effects on the environment and many studies have exposed that the resulting compaction, desalinization, pollution of water and soil from chemical inputs and the tradition of monocropping has had devastating environmental effects (Alvares, 1992; Pollan, 1998; Shiva, 1994; Tilley, 1995). However, with recent innovations in the field of modern biotechnology, genetically modified crops are thought to not only provide the production security that Green Revolution technology did, but could provide an environmentally responsible way to produce food.

One of the most successful agents for biological control, first discovered in the early 1980's was *Bacillus thuringiensis* (Bt), a bacterium that makes insecticidal chemicals.² Although Bt is more commonly known for its use as a chemical spray, it has also been inserted directly into the plants themselves. These new 'operating systems' as they have been termed by corporations such as Monsanto, provide pest resistant strains of tomatoes, potatoes, tobacco, corn and cotton. In 1995 New Leaf Russet Burbank potatoes became the first of such genetically modified, insect resistant crops to receive full regulatory approval for commercialization in the US. Bt corn and Bt cotton, and other products such as Monsanto's glyphosate-resistant soybeans have also been approved and grocery stores now sell these varieties. From the production end, these modern seeds promise to eliminate the need for even a single spraying of pesticide. This is very simply,

² When Bt is ingested by insects the bacterial spores germinate and produce their toxins, which eventually kills the insect. By 1997 the genetic codes for over 50 Bt insecticides had been found, many of them have already been applied as controls against pests such as gypsy moth caterpillars, tobacco horn-worms, Colorado potato beetles and cotton bollworms.

an economic and environmental boon. In his interviews with American farmers, Michael Pollan reminds those of us who may of forgotten (or perhaps never realized) that the conventional farmer's season entails numerous applications of chemicals.

The benefits of a biological technology that reduces if not possibly eliminates these kind of environmental and health risks and cuts down on the costs of capital intensive inputs is clearly compelling to most. However, perhaps from the consumer point of view, the most alarming and indicative change incurred with the use of such modern biotechnology is that farmers will now eat their own produce. As one farmer in Pollan's study states: "I like to eat organic food, and in fact I raise a lot of it at the house. The vegetables we buy at the market we just wash and wash and wash. I'm not sure I should be saying this, but I always plant a small area of potatoes without any chemicals. By the end of the season, my field potatoes are fine to eat, but any potatoes I pulled out today are probably full of systemics. I don't eat them" (Pollan, 1998:10). In interviews with other farmers, Pollan finds that many readily will eat the transgenic New Leaf variety.

One might consider that shifts in agriculture farming to ICM³ (Integrated Crop Management) may also change the ways in which farmers perceive their fields. One of the important aspects of ICM using genetically modified organisms or GMO's is the integration of insect 'refuges' into cropping practices. Refuges are swaths of land that are not planted with GMO's and hence inter space the genetically altered crops with conventional varieties that continue to be sprayed. As the introduction of genetically altered crops is relatively new, and there are some concerns that they will contribute to insect resistance, refuges act to reduce the likelihood of resistant insects propagating with other resistant insects. The susceptible insects

³ Integrated Crop Management (ICM) is a contemporary approach in the field of agriculture that uses a combination of the best technologies and methods available to achieve pest control, while striving to have the least impact on the overall environment. Given that the controlling of insects, weeds and diseases has always been a serious challenge facing farmers, the technology employed has subsequently reflected this concern. Although the use of insecticides, fungicides and herbicides continues to be of importance in ICM, the inclusion of 'biological' controls has greatly reduced the chemical inputs. Selective pesticide and pest-resistant plant varieties compatible with these methods contribute to a fully integrated ICM program.

inhabiting these refuges would then crossbreed with their resistant neighbours, reducing the chance of spreading resistant genes (Grace, 1997). Although the notion of the refuge may initially be foreign to conventional farmers, what it may initiate is a shift from perceiving the field as a factory to that of an ecosystem. The incorporation of the refuge into conventional farming could in fact indicate to a farmer that as in an ecosystem, not all insects are bad and that the relationship between various species can in fact be manipulated to achieve desired ends, in this case the sustainability of Bt.

2.1.2 From Green to Biotechnology Revolution

Some however, would argue that genetic modification is just one more in a long line of 'silver bullets' that provide short term responses without any long term gain. In effect the introduction of biological inputs would change very few aspects of the conventional agricultural arena, let alone within the scientific paradigm from whence it came. In fact numerous concerns raised over the introduction of transgenic varieties in various sectors, highlight the larger socio-political and economic context in which scientific advances are made.

Among the concerns raised by dissenting voices in various sectors, are those exposing the larger surrounding issues of distribution. From the agricultural context, lessons learned from the Green Revolution went beyond concerns regarding the environmental and health impacts of the necessary capital intensive inputs. In fact it has been argued that although such factors were clearly of concern, distribution was a major socio-economic influence. Underlying this is the need to make a distinction as insisted by Sen between increasing food supply and increasing entitlements (Sen, 1989). Although the social, economic and environmental impacts of the GR varied from region to region (Tiles, 1995), the lessons learned, point to a fuller conception of agricultural practices and the societies in which they exist, that moves beyond augments in supply. This of course seems to be disregarded by the biotechnology industry, in their eagerness

to supply the world with the next 'silver bullet'. Dr. Swaminathan of the Swaminathan Institute in India furthermore acknowledges that if biotechnology is to be successful, it must be conceived of in terms of ecotechnology that shifts towards an ecosystem approach (Swaminathan, 1998).

While the implications of 'unforeseen' elements such as the health and environmental impacts of Green Revolution (GR) inputs, or externalities such as distribution clearly underline the greater complexities of ensuring food security, numerous studies have demonstrated, that the greater lesson to be learned from the GR, is that such unforeseen implications may in fact function to undermine that which the technological bullet sought to promote in the first place.

The development of the High Yielding Varieties (HYVs) that were so widely promoted as the solution to food security, have in fact functioned to undermine this security. The improved varieties, in replacing the original landraces or folk varieties that have been cultivated by indigenous and local peoples for generations, have actually facilitated their extinction. Cary Fowler and Pat Mooney state in their 1990 publication, *Shattering*: " 'Modern' plant breeding efforts begun in Europe and North America in the 19th Century initiated the process of replacing the traditional land races with new, inbred varieties. By the early twentieth century many of the European landraces-types grown for hundreds and even thousands of years-had disappeared...No one seemed to realize that after countless generations, the traditional varieties were domesticated. Unlike weeds or wild species, they became dependent on people for their existence. Replacement was and is simply another word for extinction. Land races that disappeared were gone forever" (Fowler, 1990:60). A study undertaken by the Rural Advancement Foundation (RAFI) explores the extent to which varieties have been lost through an analysis of seed company offerings over an 80 year period. Although this research does not take into consideration all possible synonyms for plant varieties, nor the informal breeding activities, it uncovers alarming rates of varietal erosion. For example RAFI concludes that approximately 97 per cent of the

vegetable varieties given to the old USDA lists 80 years ago are now extinct. Similarly, in the US alone over 86.2 and 87.7 per cent of apple and pear varieties respectively have become extinct in less than a century. The new varieties of rice and wheat for example, that came out of the proliferation of international agricultural research institutions such as IRRI in the Philippines (International Rice Research Institute) and CIMMYT in Mexico (International Centre for the improvement of Maize and Wheat) had covered almost 44 and 27 per cent of all land in 'miracle' varieties of wheat and rice by 1976. Today they are virtually grown in every corner of the world.

While Fowler et.al goes on to argue that such trends were in no way deliberate, but reflective of a world vision of progress, in this case the progress associated with improved varieties, others such as Claude Alvares point to such trends as reflective of an inherently violent model of development that is "...used to straight jacket diverse socio-geographical, bio-regional phenomena that had evolved in response to different specific environments all over the South" (1992:34). Alvares goes on to highlight the extent of dire health and environmental impacts as a result of the substitution of Western crops and products for local ones. He also questions the assumed augmentation of production as a result of GR technologies and points to studies reflective of Sens entitlement research. Other articles, such as that of the Vandana Shiva, explores the gender implications of GR technology as women's vast knowledge of varieties⁴ is displaced with the 'high yielding varieties' developed by the masculinized IARCs (1989). Whether deliberate or not, the unforeseen consequences of the GR has led to the extinction of a substantial quantity of the earth's agro-biodiversity, and has had far reaching social implications for the indigenous and local communities that have largely maintained this diversity.

Meanwhile the Department of Agriculture in the United States (USDA) recently proposed that a new 'organic standards' rule should be created that would include biotechnology.

⁴ FAO has undertaken substantial research that demonstrates that women have been the primary holders of knowledge related to plant varieties and selection (<http://www.fao.org>).

The results due to public pressure have staved off such a decision. This brings to light a growing concern among consumers, regarding the implications of biotechnology. Although such concerns are perceived by industry as largely due to the misguided 'bad press' that has provoked alarmist sentiments amongst the public (Pramer, 1990; Angell, 1998) they raise serious questions about the science of biotechnology and the ways in which it is legitimized and deployed. One might consider that the new 'silver bullet' is not a new paradigm, but rather something that will allow the old paradigm to survive. There is in fact not much about modern biotechnology farming that is organic. One hurdle the USDA might want to consider is the three year chemical free period that a field must undergo in order to be considered organic. Furthermore, it would appear that these new industrial food chains would begin to break down given the low input requirements for organic farming. However, organic farming goes beyond analyses of inputs and outputs and emphasizes process, something the conventional continuum does not. The systematized 'cycles' of the latter have more to do with industrial design than with natural interactions and cycles. Furthermore the monocropping tendencies of the GR technology continue to threaten the earth's agro-biodiversity, something organic farming may actually promote.

2.1.3 The Threat of 'Genetic Pollution'

In deed 'genetic pollution' has become central to the contemporary concerns regarding the modern breeding paradigm. As research has been increasingly demonstrating the links between horizontal gene transfer and subsequent genetic recombination. Unlike the G.R. technology, it would appear that the hazards may be inherent in the biotechnology itself. As Dr. Mae-Wan Ho, director of the Bioelectrodynamics Laboratory at the Open University, UK states: "Genetic engineering increases the frequency of the transfer of disease-causing genes across unrelated species of animals and plants. The danger of genetically engineered foods is thus to be found in the technology itself" (Ho, 1997:10). Dr. Ho points to studies that link the emergence

of both pathogenic bacteria and antibiotic resistant to horizontal gene transfer.⁵ Dr. Ho points to horizontal gene transfer and subsequent genetic recombination having generated bacterial strains responsible for the cholera outbreak in India in 1992 and the *Streptococcus* epidemic in Tayside in 1993. However, for the purposes of this discussion it is clear that horizontal gene transfer is the primary tool of genetic engineering. It is designed to break down species barriers in order to override the inherent defence mechanism that would naturally reject the transfer of alien substances.

This kind of science has already resulted in subsequent genetic recombination. A recent study published in *Nature* demonstrates the gene flow from transgenic oilseed rape to wild radish weed (Chevre, 1997). The result of such recombination's leading to herbicide resistant weeds, or what Shiva has called 'Superweeds' (Shiva, 1997) has also been found in studies regarding insects. Whereas the oilseed rape study was performed on a test crop, the recent study regarding Monsanto's Bt cotton crop were performed on what is the first large-scale planting of a transgenic crop. The insecticidal cotton in fact fell prey to the cotton bollworm it was intended to kill (*Science*, Vol.273:423). Furthermore concerns regarding the mating of insecticide resistant insects have been voiced about various transgenic crops such as the New Leaf Potato investigated by Michael Pollan. The response of the suppliers has been the incorporation of 'refuges' as formerly discussed. One might question the fact that the threat that such recombinations pose to agricultural and plant diversity seems to be comfortably 'secured' by the corporations suggestions for intermittent transgenic free swaths of land. Something Michael Pollan found to be virtually disregarded by transgenic farmers. It is clear however that these studies are revealing considerable concerns regarding the rapid integration of modern biotechnology applications into farming practices. Transgenic products in the United States are all USDA, EPA and FDA approved. One might question how food products like the transgenic Soya bean, maize, rice,

⁵ Horizontal gene transfer refers to the transfer of genes to unrelated species, by infection through viruses, through DNA or pieces of genetic material that are integrated into the cell from the environment, or as in the case of transgenesis, by the 'unusual' mating taking place between unrelated species.

wheat and so forth have been approved in the first place, given that they now contain what was once considered 'dangerous' chemicals when applied externally. Are these transgenic varieties food or chemical?

The entire biotechnology project becomes extremely questionable given that the 'life industries' who are charting these unknown waters on behalf of humanity, refuse to identify their products. The year of 1998 was marked by resistance in Europe to genetically altered crops. Not only is Monsanto refusing to label its genetically altered products, it has already flooded markets internationally. As the *Globe and Mail* reported, "Monsanto has also angered the health-food lobby by mixing its genetically altered Soya bean with unaltered Soya bean, so that it is impossible for consumers to know the difference. Soya bean is used in about 60 per cent of processed food, as an emulsifier, so the genetically altered material has already entered the UK food chain" (*Globe & Mail*, 1998). This entire issue is furthermore wrapped up in international trade politics as Ottawa fights European restrictions on Canadian soybeans, canola and other by-products. Nearly a quarter of Canada's canola crop is derived from transgenic strains which are then pooled (*Globe & Mail*, 1998). In the US, grocery stores that attempted to label non-transgenic products in response to concerns regarding bovine growth hormone, claim to have been threatened by Monsanto (*Fox TV Series*, 1998).

Although it is not within the scope of this research to outline the numerous studies that have been undertaken on the adverse effects that modern breeding techniques have wrought on the earth's agricultural biological diversity, not to mention the kinds of losses that species diversity has undergone more generally as a result of anthropogenic activities, it is clear that the concerns for the ongoing loss of the earth's biodiversity are being echoed in various sectors of society around the globe. In deed, albeit from an anthropocentric view point, The Convention on Biological Diversity, which was signed by 168 countries in 1993, recognizes and supports, that

“The Earth’s biological resources are vital to humanity’s economic and social development... (and) at the same time, the threat to species and ecosystems has never been as great as today. Species extinction caused by human activities continues at an alarming rate” (CBD,1992:1). The CBD represents a dramatic step forward in its acknowledgement of the human causes for declining biodiversity and its commitment to the conservation of that diversity, other more locally based initiatives, such as the Registry, also seek to confront these trends. However, ongoing developments in the fields of biotechnology and the legal system that supports it, continue to ignore its warning.

While recent innovations in the field of biotechnology may provide various ‘organic’ solutions for a rapidly expanding world population, the external costs at which such progress may be achieved are increasingly coming under fire. Furthermore, the complexity of issues revolving around the control that biotechnology corporations are usurping on behalf of humanity are contingent on the legal mechanisms they employ for the sustained industrial ownership of life forms. These various legal and political mechanisms in fact ensure that the benefits accrued from the centralization of inputs is increasingly concentrated into a shrinking number of corporate hands with little or no recognition of the peoples that have contributed to it in the first place.

2.2 TRIPs and the Globalization of IPR

And surely you will easily believe that we, that have so many things truly natural which induce admiration, could in a world of particulars deceive the senses if we would disguise those things, and labor to make them more miraculous. But we do hate all impostures and lies, insomuch as we have severely forbidden it to all our fellows, under pain of ignominy and fines, that they do not show any natural work or thing adorned or swelling, but only pure as it is, and without all affection of strangeness (Bacon, 1901:135).

The organic Utopia as imagined by Bacon has perhaps arrived, some 400 years later to a very different island than his New Atlantis. Clearly as the ongoing battles waged over the

classification of 'life forms' are being fought, they must also be necessarily communicated as part of their legitimation. Central to a discussion on biotechnology are the legal mechanisms that function as spatial strategies in communicating the ownership over newly classified areas (Sach, 1986). As a result of the commercialization of biotechnology research, intellectual property rights (IPR) are being granted to inventors as incentive for continued research. Research that in many cases has been based on the biological diversity and informal innovations of I&L communities in the South. Furthermore, some would argue that such rights are being extended internationally, with the pressure towards an 'international harmonization' of IPR through the General Agreement on Trade and Tariffs (GATT), Trade Related Intellectual Property Rights (TRIPS). Hence the proposal for the establishment of global intellectual property rights involving plants, animals and organisms (*United Nations*, 1993), it is argued by some, not only raises environmental and other concerns, but furthers the legitimization of control and ownership of primarily Northern corporations with little or no acknowledgment for the informal contributions of I&L communities in the South.

Intellectual property compounds both an idea and the acknowledgement of that idea (Sherwood, 1990). The inventions and creative expression that arise from an idea, are necessarily complimented by the public willingness to bestow the status of property on those expressions, in order for them to become an intellectual property right. The inventor, person or corporation, is rewarded with the 'rights' of exclusive use, or earn royalties by renting out its use. These 'rights' are conferred by awarding patents, copyright or trademarks to the inventor or owner (Sherwood, 1990; Crespi, 1994). The rationale for IPRs is based on an incentive and reward system, whereby the inventor is encouraged to innovate for a monopoly profit, in exchange for the full disclosure of the invention in a way that will enable the skilled public to reproduce it.

2.2.1 From a Material to Intellectual Technology Market

Developed countries such as the US have continued to foster and promote their comparative advantage, realized through innovation and technological development through the globalization of the IPR system (Dawkins, et. al., 1996; Gadbow, 1988). For developing countries, the ability to obtain technology without compromising their development became an economic imperative. The inclusion of IPRs in the GATT sought to address the possible distortions in international trade. Developed countries such as the US considered such distortions to be caused by the lack of consistent protection of intellectual property. Furthermore, corporations in the North were concerned that the lax, or non-existent patent laws in the South, would allow for the latter to 'pirate' the knowledge and creativity of Northern inventions. The US alone claims they are losing between \$100 million and \$300 million each year, due to weak IPR protection in the South (Shiva, 1997). The GATT could adapt to a change in the reality of international trade that would better reflect the export of goods with high levels of intellectual property content.

TRIPS, reflective of an increasingly intellectual, rather than material technological market, seek to encourage the flows of intellectual innovation. Innovators or entrepreneurs who commercialize inventions require assurance that a mechanism exists to protect and ensure financial returns from their investment. Profiting from any innovative technology is made possible, especially with regards to easily replicable technology, when innovators have monopoly rights to make, use and sell their products. An international patenting system provides the protection needed for the R & D of the expensive biotechnology that is rapidly transforming the modern international market. Given the backdrop of an increasingly liberalized market economy, an inadequate IPR would serve as a non-tariff barrier, as it would stifle the flows of inventions. TRIPS would provide the means for furthering the liberalization of the intellectual commodity

across borders. However, various concerns have been raised about the TRIPS in general, that require further analysis. The following explores some of the controversial ideological notions embodied in the TRIPS, that appear to contradict the fundamental principles of liberalization, and furthermore provide 'security' and 'control' to Northern corporations at the expense of the environment and 'development' of the South.

Despite the fact that the notion of monopoly is inherently counter to liberalization, it appears to have been rationalized through the mechanism of IPRs in the Uruguay Round. However the argument that property rights stimulate innovation and creativity as the inventor is guaranteed exclusive access to a secured market has been thrown into question. Some ask whether or not this sense of security would in fact inhibit the inventors drive towards further innovation as it would given open competition? Would it not be possible for a corporation to purchase and shelve a patent on an invention which threatens to render its activities obsolete? This in itself constitutes a form of protectionism that inhibits the diffusion of technological knowledge and hence, prevents further technological development. Protectionism runs counter to the principles of liberalization, which is so devoutly advocated by the developed countries. As Martin Khor states: "Thus there are double standards in the industrial world's approach: liberalization if it suits us, protectionism too if that suits us; the real underlying principle is pure self-interest" (Khor, 1990). The effects of the kind of intellectual property regime, proposed in the TRIPS could not only prevent the diffusion of possibly more appropriate technology, but could increase the monopoly royalties of the Northern TNCs while stifling the potential development of the South. Northern TNCs could profit from this system by 'artificially' maintaining 'old technology' markets and drawing the maximum profit from them before moving on.

Several of the TRIPS provisions provide insight into the various mechanisms for its monopolistic aims. In addition to the fact that the TRIPS extends patents to microbiological

processes and their products, micro-organisms and the requirement to provide IPR on plant varieties either by patent or an effective *sui generis* system, it goes on to specify in Article 27.1 of the TRIPS agreement that "...patents shall be available for any inventions, whether products or processes, in all fields of technology,..." (WTO, 1999). Whereas in many developing countries there are only patents on process (Bhat, 1996), the TRIPS agreement extends the inventors rights to include products. Not only would this inclusion enable right holders to appropriate higher profits from a given technology, but it would stunt competition . This provision may bar other innovators from developing better, cost-efficient technologies. In the biotechnology field, firms such as W.R. Grace Agracetus Inc., a US subsidiary has already acquired product patents that monopolize a rapidly transformative and relatively new field. The afore mentioned firm has patents for all such genetically engineered cotton varieties until the year 2008. As a result, all transgenic cotton products, regardless of the engineering technique used, will have to be commercially licensed by Agracetus Inc..

If the proponents of liberalization, were concerned about the promotion of competition, one would imagine that the term of a patent would be reduced. Given the rapid pace of technological innovation, it would be essential to decrease the term for monopoly of a given product in order to stimulate innovations. However, under Article 33 of the TRIPS agreement, the general term of a patent has been extended from 17 years to 20 years (WTO, 1999). This provides a longer period from which to recover monopoly rents from a protected technology. Furthermore, an inventor [or patent holding corporation] could withhold a newly developed innovative product from commercialization in order to maximize returns from a current investment on a product previously patented. Finally, the TRIPS ensures that no ceiling is placed on royalties demanded, hence patent holders can charge high monopoly royalties. For example, farmers are required to pay royalties to the patent holders for saving seeds for subsequent years, or have had to purchase new seeds every year (Bhat, 1996; Alvares, 1997;

Shiva, 1997). One of the feature characteristics of hybrid and transgenic varieties is that they do not breed true-to type seed. Therefore farmers have to go back to the producer year after year. Among other effects, this not only inhibits the tradition of saving seed and best selection but clearly creates a strong dependency of the farmer on the corporate producer.

These monopolistic trends however, are exacerbated by various corporate policies that have functioned to further marginalize indigenous and local farmers, often in Southern countries. Corporations such as Monsanto, for example, continue to charge farmers a 'technology fee' in addition to the price of the seed, for the 'peace of mind' its genetically engineered varieties give farmers. Rules that restrict farmers from saving or selling seeds, further protects the 'inventor' from license violations and patent right infringements (Ho, 1997; Shiva, 1997; Tokar, 1997). The projected control that corporations are communicating at the international and national level are furthermore physically enforced through corporate 'pinkertons' that ensure that royalties are being paid by big growers (RAFI, 1998). A recent agreement attempted by Monsanto with the Grameen Bank would have further ensured the enforcement of their control over thousands of smaller credit loan farmers in the South⁶ (RAFI, 1998). Through such strategic moves, these life industries continue to ensure their unchallenged supremacy.

2.2.2 Towards a Vertically Integrated Market

Even the concern that the very IPR system that legitimizes such 'security' could limit corporate movement, has greatly been diminished by a few giant life industries. Plant breeding is increasingly coming under the control of a small number of TNCs. Of 1500 seed companies in the world, 24 hold a combined market share of more than 50%. Of these, eight are transnational corporations and all 24 are parent companies in the agricultural sector with subsidiaries food processing, trade and agro-chemicals (Dawkins, 1996). This corporate movement towards

⁶ The Grameen Bank is a micro-credit bank that provides collateral free loans to women. Although it began in Bangladesh it has been replicated the world over for its high rates of success.

vertical integration into a given sector further extends the control and power the 'life industries'. As Pat Roy Mooney of the Rural Advancement Foundation International (RAFI) states: "The intellectual property system allows corporations to side-step national competition and cartel laws. Through patents corporations can integrate vertically downward to monopolize basic research, or horizontally, to span related commercial fields. A giant like Novartis, for example, could trade its pesticides patents for Asia in return for Monsanto's seed patents in Europe" (Mooney, 1997:139). Furthermore he points out that these transnationals can simply buy the company holding the patent rather than fight for the rights in court. Recent developments in the biotechnology industry have further demonstrated that legal mechanisms and economic power may even be redundant. Corporations may be able to 'corner the market' with the technology itself.⁷ While these developments have and continue to raise concerns regarding the exclusivity of trends in the fields of biotechnology and IPR, their exclusivity is also concerning to I&L communities and civil society organizations that claim that these unbalanced developments are in fact contributing to the continued misappropriation biological diversity and the associated knowledge of indigenous and local peoples of the South.

⁷ The ultimate spatial strategy has recently been realized with the creation of the Terminator Technology.¹ Initially patented jointly in the United States by the USDA and Delta & Pine Land Co., but recently bought by Monsanto, as a result of a corporate merger, Terminator Technology makes 'pinkertons obsolete'. This patented technique genetically alters the seed so that it will not germinate if replanted a second time. The technology in fact aims to prevent farmers from saving their harvest in order to replant. As the Rural Advancement Foundation International argues "If commercially viable, the Terminator technology will have profound implications for agriculture. It is a global threat to farmers, biodiversity and food security..." If the Terminator is widely utilized, it will give the multinational seed and agrochemical industry an unprecedented and extremely dangerous capacity to control the world's food supply" (RAFI, March/April, 1998). One of the greatest concerns is that Terminator may also be promiscuous. Although the corporate strategy is to market the Terminator as ensuring BioSafety (as the seed would be considered sterile and therefore less apt to propagate) RAFI cites a Chilean Agronomist that is concerned with a number of studies that reflect that pollen from crops carrying the Terminator technology could infect the fields of farmers who have either rejected or could not afford the technology. As a result of public outcry, the Terminator has been dropped by Monsanto. Indications such as the manifestations of farmers in India in 1998 however, indicate that the Terminator may have already made it into farmer's fields.

Although Francis Bacon could not have foreseen the totality of consequences that the project of modernity would bring, it is clear that his vision was of an organic alternative that would move beyond the violence and destruction of the mechanical model in place. In many ways, the solutions currently held by many as the panacea to environmental and other concerns is the very utopia he envisioned. Bacon imagined a world so technologically advanced that the modes of production would themselves be embodied within the product. Contemporary scientific inquiries into the biological makeup of organisms, have at one level provided this very dream. However, Bacon's utopia can be contrasted with countless other 'fictions' that warn of Frankensteinian horrors or the reflections of a grotesque imagination. As the above exploration demonstrates, contemporary spatial strategies of biotechnology corporations through various technical, legal and political mechanisms expose an 'organic' alternative that certainly revolves around something a little less than the perfect place and state of things. As has thus far been explored, newly found 'utopia's' are seemingly caught up in the mechanisms of 'control' through the ownership of their inner spaces. However as the following chapter will explore, such strategies are being contested through the development of alternative proposals, that increasingly reflect the values of peoples and communities outside of this dominant project. Such visions have also contributed to development of the Registry as an associated mechanism that may be rooted in a particular ontology that refutes the conception of a world in which the chimeras of 'men' are stirred by its continued expansion.

Chapter 3

Biopiracy

Biopiracy is the Columbian 'discovery' 500 years after Columbus. Patents are still the means to protect this piracy of the wealth of non-Western peoples as a right of Western powers. Through patents and genetic engineering, new colonies are being carved out. The land, the forests, the rivers, the oceans, and the atmosphere have all been colonized, eroded, and polluted. Capital now has to look for new colonies to invade and exploit for its further accumulation. These new colonies are, in my view, the interior spaces of the bodies of women, plants, and animals. Resistance to biopiracy is a resistance to the ultimate colonization of life itself - of the future of evolution as well as the future of non-Western traditions of relating to and knowing nature. It is a struggle to protect the freedom of diverse species to evolve. It is a struggle to protect the freedom of diverse cultures to evolve. It is a struggle to conserve both cultural and biological diversity (Shiva, 1997).

Such are the stirring words of Vandana Shiva as she begins her explorations into various issues regarding the environment, agriculture, spirituality and women's rights in her book, *Biopiracy The plunder of Nature and Knowledge*. Shiva, one of India's leading physicists and a world renowned radical scientist brings to light some of the many controversies that have recently arisen in the field of biotechnology and intellectual property rights. Central to her argument, is that these contemporary concerns are merely an extension of the violence of the historical continuum of the Western development paradigm. These strong convictions are not however, unique to Shiva or the South. They are heard in the dissenting voices of indigenous and non-indigenous peoples around the world. The numerous and sometimes overlapping concerns are among other things, with regards to the 1) unmitigated access that the private and public sectors have to the genetic and biological resources and associated knowledge found within the lands inhabited by I&L peoples, 2) the threats that modern breeding techniques pose to this knowledge and these resources, and 3) the nature of the property rights system that secures industries' exclusive ownership and control over 'innovations' often based on the knowledge of indigenous and local peoples'. Commonly cited themes refer to the lack of consent from and acknowledgment of relevant communities, the self-serving definitional basis of the intellectual property rights system that is generally either not applicable to I&LK, nor in some cases appropriate, and the 'threat to life' posed by various modern developments. As will be explored

in the following 2 chapters, these concerns have in many cases led to a variety of responses, from the formulation of indigenous and non-indigenous declarations, concepts and model laws, to the involvement of communities in the development of conceived tools such the Registry. It will be demonstrated that although the misappropriation of indigenous and local knowledge (I&LK) continues to be supported by various legal and technical mechanisms, such mechanisms have not gone unaffected by the growing support for alternative visions.

Biopiracy is defined by the Rural Advancement Foundation International (RAFI) as:

“The use of intellectual property to legitimize the exclusive ownership and control of biological resources and knowledge, without recognition, reward or protection to informal innovators” (1994:72). In some cases the concerns raised have less to do with the notion of the ‘ownership of life’ than with the lack of recognition given to what is in some cases the original holders of the knowledge. This is clearly reflected in the words of representatives from the Coordinadora de las organizaciones indigenas de la cuenca amazonica (COICA) a Latin American indigenous umbrella organization that represents approximately 400 indigenous communities (over 2 million people) in the various amazonian basin countries: “No es que los pueblos indigenas estan en contra de hacer aportes a nuevas investigaciones. Lo que pasa es que ha hagido una usurpacion indebida de conocimientos tradicionales, sin que los pueblos indigenas sean beneficiarios de las actividades que genera una investigacion” (COICA, 1999:13). [It’s not that indigenous peoples are against new kinds of research. What has happened is that there has been an usurpation of traditional knowledge without the acknowledgment of the indigenous peoples from which that knowledge originally came].¹ A central aspect of this concern is that the predominantly Northern institutes involved in bioprospecting activities have accumulated and continue to accumulate vast amounts of profits, both monetary and non-monetary (such as meeting the agricultural and health

¹ Please note that square brackets indicates my own translation of the preceeding quote.

needs of Northern and Southern populations),² without providing just acknowledgement or compensation in return for I&L contributions.

3.1 *Origins North and South*

It has been argued that IPRs are often granted for knowledge and or resources originating in the South (Accion Ecologica, 1999; COICA, 1999; Cultural Survival, 1997; *Journal of Indigenous Knowledge*; RAFI, 1994). The recent dispute over a patent granted to a US firm for a new long grained aromatic basmati rice variety highlights the issues of ‘piracy’ by Northern corporations in the South. Numerous patents have been taken out by Northern biotechnology and pharmaceutical companies on various agricultural and medicinal plants that have been a part of a culture that in many cases has supported the historical development of the plant. Cases such as the patenting of various properties of the turmeric powder, which has been used for centuries in India as a dye and spice and as a traditional medicine to treat wounds, and numerous properties of the Neem Tree which has held medicinal and religious value, are often cited as examples of what corporations are attempting to have ownership rights to. Although the Neem case was fought by India, through the Dispute Settlement Body of the WTO,³ turmeric represents the many cases that have not been won by the South. Pat Roy Mooney of RAFI provides a list of what he calls the 20 most outrageous patents. These patents are held by a few Northern corporation for derivations of Southern resources such as Quinao, Barbasco, and Sangre de Drago to name a few from Latin America, and J’oublie, and Greenheart from parts of Africa (Mooney, 1997).

Bioprospecting activities however, are not limited to the South alone. In the case of Monsanto’s New Leaf Russet Burbank Potatoes explored above, it is the insertion of *Bacillus*

² Elizabeth Bravo of Accion Ecologica, a Latin American NGO, further points out with regards to pharmaceutical prospecting, that much of the research that takes place is reflective of Northern health needs and not that of the Southern indigenous from where the genetic information arises in the first place.

³ Some sources indicate that it was fought bilaterally through the US Supreme Court.

thuringiensis or Bt, a soil microbe that has been used as a natural pesticide by organic farmers for generations, that gave rise to a patentable innovation in the first place. These advances in microbial technology, or a 'Brown Revolution' are in fact based on the removal of resources from national territories and more often based on I&L knowledge that may have originally helped to identify the microbe. While the removal of natural resources constitutes a violation of the rights of people through their government and is clearly an issue of sovereignty, as Pat Roy Mooney of the Rural Advancement Foundation International (RAFI) states: "...to a degree that would be astonishing to many scientists, the particular properties of certain soils have long been recognized and valued by indigenous peoples. They may not be aware of the exact chemical compound resident in the plant or soil, but the anti-tumour, antibiotic or steroid characteristics of certain soils are known and valued. Community healers customarily apply both plant remedies and soil samples to wounds and diseases. Competent biopirates make use of this community knowledge when they go off 'inventing' in the Andes" (*The Development Digest*, 1997:111). Mooney goes on to outline the wide scope of soil microbial prospecting alone, by Northern corporations in I&L communities around the world. Examples abound in the area of soil research, such as the 'soil sandwich' taken by women and children of the Kikuyu tribes in Africa and African-Americans in North Carolina for its richness in iron and iodine, to the use of yellowish soil in China's Hunan Province in times of famine. The recent example of research done on red soil found near termite mounds and used for upset stomachs in Zimbabwe, points to the presence of kaolinite, the key compound in commercial anti-diarrhoeics.

3.2 *The Scope of Bioprospecting Activities*

Pharmaceutical corporations such as Merck, Pfizer, Eli Lilly and Bristol-Myers Squibb (BMS) to name a few, do a wide variety of soil research North and South that brings in large revenues. Merck has done research on soil fungus in Kenya that has led to the development of

testosterone used among other things to treat acne, and in Namibia for manic depression. Eli Lilly developed Erythromycin, a new antibiotic and apparently the most commercially lucrative drug in the world, from research in the Philippines (Mooney, 1997). BMS alone holds 38 foreign accessions, each with at least one patent claim. Although there are no clear statistics in the field, such wide ranging acquisitions are representative of a fraction of the ongoing research on soil that brings in large revenues for biotechnology and pharmaceutical corporations. For example, the deal that Merck signed with the Costa Rican NGO, the National Biodiversity Institute (Inbio) led to a sales of 8.1 billion alone in 1991. Costa Rica's GNP that year was only USD 5.2 billion. Apparently Merck has three drugs with sales in excess of USD 1 billion each. While the samples that bring in such revenues may be clearly negotiated with the providing country, such as the Merck/Inbio deal, they generally do not acknowledge I&L communities that may have provided the lead in the first place.

Soil bioprospecting only represents a fraction of total bioprospecting activities. In 1995 "RAFI's list of bioprospectors and biopirates" outlines the research focus and scope of 56 companies, organizations and/or intermediaries primarily from the US and Europe that are undertaking research in predominantly Southern countries. The primary use of indigenous knowledge, peoples and territories is for the accumulation of ethnobotanical information and plant samples.⁴ For an understanding of the scope of plant bioprospecting for example, we have

⁴ This is not to mention that bioprospecting activities continue to occur on I&L communities themselves in the North and South as well. Last year's rash of reports in the *Globe & Mail* on human genetic prospecting in indigenous and local communities in Canada are demonstrative of only a fraction of the kinds of activities occurring with permission and without acknowledgement (1998).¹ One needs to look no further than to the patents that have been granted for Human Genomes to companies such as US Human Genome Sciences to understand the global nature of prospecting. HGA has in fact filed patent applications covering over 1 million partial human gene sequences. It also has alliances with 10 major drug corporations for the provision of access to such human genetic information (Mooney, P.R., 1997). The total information to be accumulated by the termination of the HGP will be from more than 700 indigenous nations. Recent statements by US President Bill Clinton and British Prime Minister Tony Blair, regarding the increasing competition of biotechnology corporations to patent human genome associated research findings, highlight the concerns that such trends imply for the availability of fundamental data, in this case on the human DNA sequence and its variations. As stated by the two leaders, "To realize the full promise of this research, raw fundamental data on the human genome, including the human DNA sequence and its variations, should be made freely available to scientists everywhere" (*Globe&Mail*, 25 March 2000).

only to look to the activities of the US National Cancer Institute which is undertaking investigations in more than 25 countries and has collected 10 000 plant specimens in six countries alone. While in the US, at least 25 percent of prescriptions are filled with drugs whose active ingredients are extracted or derived from plants. Sales of these plant-based drugs amounted to somewhere in the area of \$4.5 billion in 1980, increasing to \$15.5 billion by 1990. In the field of biotechnology, genetic diversity for the development of improved agricultural varieties has accounted for nearly one half of the gains in US agricultural yields from 1930 to 1980 (OTA, 1987). While such corporate and institutional gains continue to rise, only a few of the total number of these institutes demonstrate some form of reciprocity with their Southern providers.

3.3 No acknowledgement and no consent

The Indigenous People's Biodiversity Network (IPBN) points to an appalling lack of recognition and compensation, with less than 6 per cent of I&LK based medicinal plant uses actually identifying the community, and with less than 20 per cent of such cases identifying the country of origin (Mooney, 1997). When monetary compensation is awarded, it is often merely a gesture. For example the Kuna of Panama have been paid token rent and wages from North American researchers collecting samples of the region's biodiversity (Benjamin, 1997). As Atencio Lopez, a Kuna lawyer, working in the field of IPRs, states: "Indigenous peoples have been easy prey for the laboratories. Because of the insecurity that we live under, with little gifts they can buy their way into our communities. They really take advantage of that" (Benjamin, 1997). This lack of acknowledgement, or token compensation in the face of communities that may not even be able to meet their basic needs is further compounded by that fact that bioprospectors may be undertaking research without the community's consent in the first place.

While the prospecting activities outlined above, may seek the prior and informed consent of the communities and/or peoples involved, they do not necessarily outline the full implications of the research, such as possible down stream uses of the samples. In many cases I&L communities have found out about subsequent patents on an invention that may have been based on their knowledge and/or resource through a civil society group. In other cases, samples are taken without their knowledge. The NHI patent taken out on for the genetic information and cloned cells taken from a Hagahai man from Papua New Guinea in 1995 were done without prior informed consent and have received a large amount of public protest. Indeed it is this very lack of consent, that for some represents a defining factor of biopiracy. For example the paralegal pamphlets put out by the Knowledge Cartel project in Ecuador clearly indicate that it is the uninhibited access to knowledge and biological resources that constitutes biopiracy: “Por ellos a quienes toman componentes de la biodiversidad sin los permisos correspondientes se los denomina biopiratas, porque roban o asaltan la riqueza biologica”(Morales, 1999:12). [The (pharmaceutical companies) that take components of the biodiversity without the proper permission are called biopirates, because they assault or steal biological wealth]. For many, concerns with increasing trends in bioprospecting continue to point to the issues of prior informed consent and acknowledgement as important, if not central to dealing with the issues of biopiracy.

Hence, it is argued by critics such as Vandana Shiva, that the Northern corporations are manipulating or sidestepping, legal and technical mechanisms that ensure their monopoly rights and control at two levels. First it allows for the continued extraction of ‘knowledge’ as embodied in the biodiversity and humanity of the South, and secondly it provides for the royalty payments of poor Southerners to the Northern corporations for what was originally their own resource (1997). While such activities may not actually limit I&L peoples from continuing to use their

knowledge, it is clear that the lack of consent and acknowledgement for their contributions does little to support knowledge systems and resources that continues to sustain the development and prosperity of the North and the biological diversity of the planet.

Las sociedades indigenas tienden a valorar los derechos colectivos o comunales, mientras que la ley de patentes, como la mayor parte de la legislacion nacional pone enfasis en los derechos individuales. El hecho que las culturas aborigenes se basan la tradicion oral mientras que los sistemas legales nacionales dependen de las leyes escritas complica mas el asunto "...el conocimiento tradicional de los pueblos indigenas es transmitado oralmente de generacion en generacion y es practicamente desconocido por el resto del mundo(COICA, 1999: 13). [Indigenous societies have valued collective and communal rights, while patent law, like the majority of national legislation places emphasis on the rights of the individual. The fact that aboriginal cultures have an oral tradition, while national legal systems depend on complicated written law and bussiness...the traditional knowledge of indigenous communities is orally transmitted from generation to generation and is practically unknown to the rest of the world].

3.4 Cumulative and Collective Systems of Innvotion

Finally it has become clear that while tools such as intellectual property rights may be useful for non-indigenous individuals and corporations, they are often inadequate and inappropriate for I&L peoples. COICA is only one of the many voices claiming that there are incongruities between the non-indigenous system of jurisprudence and that of the indigenous peoples. With regards to indigenous and local knowledge and genetic resources, the distinctions raised are often between the reductionist nature of western IP law and the holistic nature of I&LK systems (Accion Ecologica, 1999; Brush, 1994; Cultural Survival, 1999; COICA, 1999; ILSA, 1998; Mooney, 1993; Shiva, 1999). As Gurdial S. Nijar of the Third World Network states with regards to the GATT TRIPs: "These provisions guarantee ownership rights to products made in laboratories of the North from the knowledge of indigenous and local communities. The knowledge system of these communities, their innovations in the intellectual commons, the societal and informal context in which they produce and innovate, and the purpose for which they do so - all these are denied recognition. Only the North's industrial model of innovation is

recognized; the cumulative collective system of innovation of traditional communities is excluded definitionally by the TRIPs provisions” (1996:23).

Various aspects of IP law on the one hand, translate into the provision of protection of the limited monopoly rights for individuals or corporations, for the full and written disclosure of a distinct or original innovation. Many argue that these requirements are of little use to indigenous and local communities whose knowledge is often collective, transcendent, oral, accumulative and sometimes sacred. In the case of indigenous and local farmers this knowledge is often generated informally (Fowler & Mooney, 1993). Subsequently various obstacles confront I&L peoples who maintain crop genetic resources and seek IP protection. First of all the collective nature of I&LK is simply not protected under existing IP regimes. A community cannot obtain a patent.⁵ It has been argued, that even if they could, the boundaries within and between groups could be ambiguous and the distribution of knowledge and resources amongst I&L peoples may be uneven (Brush, 1994). Furthermore collective endeavours in and of themselves could introduce the division of profits into social relations. Secondly, much of I&LK has been passed down orally from generation to generation and cannot meet the requirements of the novel innovation as a result of the work of an individual innovator. Hence the narrow definitions of innovation does not include transcendent kinds of knowing. Figure 1 highlights some of these emerging distinctions.

While IPRs may clearly be inadequate for the protection of I&LK, they may also be inappropriate. For some it is in fact the ownership of life itself that constitutes the gravest threat to I&L cultures. As Alejandro Argumedo, an indigenous researcher in the field of IPR and the

⁵ Although a community cannot obtain a patent, if the community has been recognized as a corporate own, an individual can transfer ownership of a patent to the community.

Figure 1: Non-Indigenous vs. Indigenous knowledge

Non- I&LK is valued for:						I&LK is valued for:
Informal	←	←	↔	→	→	Formal
Collective	←	←	↔	→	→	Individual
Transcendent	←	●	↔	→	→	Novel
Accumulative	●	←	↔	→	→	Original
Oral	←	←	↔	→	→	Written
Sacred	●	←	↔	→	→	Commercial
Social Benefit	←	←	↔	→	→	Commercial Benefit

*A continuum reflecting the possible limits for the valuation of non-I&LK and I&LK.
Kate Harrison 2000*

former executive director of Cultural Survival Canada, states, with regards to the patent on Ayahuasca a sacred plant from the Amazon: “The patenting of ayahuasca affects not only this one specific species, but a whole belief system. It’s affecting the way people pass on learning and knowledge, it’s impacting very profoundly on the internal processes of communities. Intellectual property can’t be separated from land rights, from cultural rights, from rights to education and religious freedom” (Akwe:kon’s Journal of Indigenous Issues, 1997:23). IPRs may even conflict directly with indigenous and local customary laws. As Thomas Greaves points out, even in cases where the knowledge is held by only one person, “...it is the control of traditional ideas and knowledge that does not lead to a commercial product, but identifies places, customs and beliefs which, if publicly known, will destroy parts of a peoples’ cultural identity”. It is this sacredness of knowledge, sometimes entrusted only to properly prepared religious specialists that may be destroyed upon disclosure to other, unqualified members. “Sometimes it is knowledge shared among all of a society’s members, but not with outsiders. Such knowledge charters a society’s sense of self; to disclose it loosens the society’s self-rationale” (Greaves, 1994:4). It is in fact this notion of sacred that for many I&L peoples alienates them from even contemplating uses of the current IP system and is at the heart of the various condemnations of existing IP rights over genetic resources.

If we look at the ayahuasca patent as an example, it will become evident that the current IP system is a self serving definitional construct that not only inhibits indigenous and local inventors who may seek protection for their 'inventions', but continues to support non-indigenous and non-local peoples to protect 'inventions' based on this knowledge.

3.4.1 The Case of Ayahuasca

On 17 June 1986 plant patent rights were assigned to the US 'inventor', Loren Miller, for a US plant patent, number PP5 751 for the *Banisteriopsis caapi* (cv) plant. "A new and distinct *Banisteriopsis caapi* plant named 'Da Vine' which is particularly characterized by the rose colour of its flower petals which fade with age to near white, and its medicinal properties" (USPTO,1999:1). The patent goes on to describe the class of patents that PP5 751 falls under in order to demonstrate that Miller invented or discovered and asexually reproduced a distinct and new variety of plant (USPTO/PLT, 1999:1). However COICA contests that there is no clear evidence that Miller improved or modified the plant, and that the plant comes directly from the backyard of an indigenous family in the Amazon basin. Such was the conviction, that on 30 March 1999, two shamans, in their traditional attire and 'flanked' by their wives, and environmental lawyers, arrived at the US Patent and Trademark Office with a petition to revoke the 13 year old patent held on their sacred plant.

The *Banisteriopsis caapi* plant, locally known as *Yagé* or Ayahuasca has been used by indigenous groups in the amazon for religious rituals for generations. These native groups, consider the Miller patent to be an appropriation of a sacred plant and a violation of their culture and religion (COICA, 1999). As Antonio Jacanamijoy, the General Coordinator for COICA states: "Nuestra preocupación no es tanto la cuestión comercial, de si se puede o no comercializar los productos derivados de esta planta. Es una cuestión cultural y espiritual"(COICA,1999). [Our concern is not so much the question of commercialization, (whether or not products derived

from plants should or should not be commercialized). It is a cultural and spiritual concern]. It is felt by groups such as COICA that the collective and religious nature of the knowledge on the one hand, negates the I&L use of current IPR laws, and on the other, has been ignored by the entire western legal system that supports the Miller patent. Interestingly enough, the patent itself refers to various prior work in the field of 'science' and law. Hence scientific journal publications and previous supporting legislation are referred to in the patent description. There is no mention of the I&L communities and regions consulted, nor is there any mention of the indigenous terminology used by such communities. Hence one might begin to question why, if non-indigenous sources are referred to in a patent without undermining the novelty of the invention, indigenous sources are not acknowledged. While we will return later to the various issues of access that may be useful for the mediation of such acts of biopiracy, what is clear at this stage, is that not only are current IPRs potentially ineffective for the protection of I&LK, but they are being used by outsiders to ensure the monopoly rights and title of non-indigenous peoples who may have based their inventions on I&LK in the first place.

For many indigenous and local communities and civil society organizations, biopiracy continues whether advertantly or inadvertantly to not only undermine the knowledge systems of I&L peoples by ignoring and discounting it, but also threatens those knowledge systems and the biological diversity they sustain. As Nijar of the Third World Network in India argues, if I&L communities are to assert control over their knowledge with regards to bioprospectors then they can either a) do nothing, b) comply with the current IPR system, finding some way to insert themselves into it and in effect, possible deny their own I&L systems or c) considering that the structure of the current IPR system does not take I&L ways of knowing into consideration, they can "...formulate a rights regime which reflects the culture and value-system of these communities as a device to prevent the usurpation, commoditisation and privatization of their

knowledge and ward off any threats to the integrity of these societies" (Nijar, 1996:24). The Registry, it is put forth by its proponents, can provide the mechanism by which these aims can be met. We now turn to some of the emerging principles and obligations that have given rise to such alternative models both within and outside of the IP regime.

Chapter 4

The Emergence of Principles and Obligations

The Eurocentric notion of ownership is destroying our peoples. We must return to our own view of the world, of the land and of development. The issue cannot be separated from indigenous people's rights (Kari-Oca Declaration, Rio de Janeiro, Brazil, May 25-30, 1992).

4.1 *Indigenous and Local Declarations and Conventions*

In the context of genetic resources and intellectual property rights, I&L concerns with the 'ownership of life' have contributed to the development of countless declarations and charters, such as the UN Draft Declaration on the Rights of Indigenous Peoples, the Kari-Oca Declaration and the Indigenous Peoples' Earth Charter, the Charter of the Indigenous-Tribal Peoples of the Tropical Forests, the Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples (Posey, 1996), the Declaration of Indigenous Peoples of the Western Hemisphere (Regarding the Human Genome Diversity Project) (Cultural Survival, 1996). Each of these statements in some way attempts to define the principles that constitute the minimal rights to which indigenous peoples are entitled, and in so doing, indirectly define notions of indigenusness.¹

¹ While there is no internationally agreed upon definition for what constitutes indigenous and or local, various declarations and statements refer to notions of indigenous as a pre-colonial identity such as "...peoples as those who have descended from populations that inhabited a country or area within a country at the time of conquest or colonization..." as defined in the International Labour Organization 169 Concerning Indigenous and Tribal Peoples in Independent Countries (ILO 169), or the '...original peoples of the Western hemisphere of the continents of North, Central and South America' as defined in The Declaration of Indigenous Peoples of the Western Hemisphere (Regarding the Human Genome Diversity Project) (Cultural Survival, 1996:63). Other defining factors refers to notions of distinctness, again in the ILO 169, "...irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions" and as defined in The Study of the Problem of Discrimination Against Indigenous Populations, more commonly referred to as the Cobo Study. Common to most of these definitions is the critical factor of 'self identification'.

Notions of local are far less clearly defined, however frequently used in the CBD and the UN Convention to Combat Desertification. In the context of the protection of indigenous and local knowledge, M. Halewood's definition of local is "...intended to embrace a wider class of individuals and communities than 'indigenous', though it may include indigenous peoples...communities that are not necessarily indigenous, but who nonetheless share several characteristics of indigenous communities living 'traditional lifestyles' ..." such as generational occupancy of a given territory, traditions linked to territory and distinct from majority of non-local population "(1999:957), provides a useful construct for distinguishing local from indigenous and non-local peoples.

With regards to what is often referred to as indigenous people's cultural and intellectual property rights, or what has also been defined as 'cultural heritage',² many of these statements begin to outline various possible conceptual bases for an indigenous and or local alternative vision. Furthermore such statements along with the elaboration of other various soft and hard law treaties have influenced the development of more equitable contract agreements, access legislation and *sui generis* IPR legislation that increasingly takes the protection of I&LK into consideration. The following section will explore these various developments that have in many ways preceded the advent to such intermediary conceived tools as the Registry.

4.1.1 An Emphasis on Non-Intellectual Property

Although various declarations, such as The Declaration of Indigenous Peoples of the Western Hemisphere (Regarding the Human Genome Diversity Project), simply oppose the patenting of all natural genetic material and denounce instruments of intellectual property rights and free trade agreements (Cultural Survival, 1996:63), many of the declarations emphasize non-IP elements such as self determination, the inalienable right of indigenous peoples to their lands and territories, their right to cultural identity, human rights, collective rights and the ratification of favourable multilateral treaties such as the Convention on Biological Diversity (CBD) and the International Labour Organization's Convention 169 (ILO169), and also identify their position with regards to indigenous people's cultural heritage. The UN Draft Declaration on the Rights of Indigenous Peoples for example states that:

Indigenous peoples are entitled to the recognition of the full ownership, control and protection of their cultural and intellectual property. They have the right to special measures to control, develop and protect their sciences, technologies and cultural manifestations, including human

² This term refers more to the natural right notion of IPR than to the legal connotation. In her Study on the protection of the cultural and intellectual property of indigenous peoples, Erica-Irene Daes, Special Rapporteur on the Sub-Commission on Prevention of Discrimination and Protection of Minorities and Chairperson of the Working Group on Indigenous Populations perhaps more appropriately uses the term 'cultural heritage' which better encompasses the more holistic view points of indigenous peoples that does not necessarily identify with the notion of property, let alone the artificial distinction between cultural and intellectual property (ECOSOC, 1993).

and other genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literature's, designs, and visual and performing arts (1993:186).

The Indigenous Peoples' Earth Charter states that:

As creators and carriers of civilizations which have given and continue to share knowledge, experience, and values with humanity, we require that our right to intellectual and cultural properties be guaranteed and that the mechanism for each implementation be in favour of our peoples and studied in depth and implemented. This respect must include the right over genetic resources, gene banks, biotechnology, and knowledge of biodiversity programs (1992:197).

Similar sentiments are reiterated in the Charter of the Indigenous-Tribal Peoples of the Tropical Forests with the added demand that indigenous peoples have control over the development and manipulation of their knowledge. Finally and perhaps more elaborately, the Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples recommends to states and national and international agencies that they with the full cooperation of indigenous peoples, develop an additional cultural and intellectual property rights regime incorporating:

Collective (as well as individual) ownership and origin-retroactive coverage of historical as well as contemporary works; protection against debasement of culturally significant items; co-operative rather than competitive framework; first beneficiaries to be the direct descendants of the traditional guardians of that knowledge and multigenerational coverage span (1993, 1997:207).

What is common to these and other declarations, is that except in the case of The Declaration of Indigenous Peoples of the Western Hemisphere (Regarding the Human Genome Diversity Project), they are not necessarily in opposition to bioprospecting per se, but seek greater control over the access to the genetic and biological diversity that is found upon the lands and waters that they inhabit and or use, and to the knowledge that they hold. Furthermore, it is the principles and obligations arising from these and other non-indigenous declarations that have begun to take larger effect in the overall negotiations surrounding access to genetic and biological resources.

4.2 Access to Genetic Resources and International Instruments

Innovation based on genetic diversity has always relied on having physical access to genetic material” (Glowka, 1998:1). So begins a recent IUCN³ publication by Lyle Glowka entitled: *A Guide to Designing Legal Frameworks to Determine Access to Genetic Resources*. Among other various elements related to I&LK, Glowka goes on to explain that until recently, access to genetic resources have largely gone uncontrolled. It is only within the past two decades that developing countries in particular have begun to perceive this as an inequitable situation, given that it is the developing countries that generally hold the vast majority of the earth’s genetic biodiversity and the developed countries that have held the greatest technological capacity for its exploitation. Furthermore, it has more recently been argued, that the capturing of such benefits could also function to promote the conservation of biological diversity and the sustainable use of its components. Hence the statements as put forward in I&L declarations, are only one element in the overall increasing attention given to the issue of how genetic resource providers can ‘capture the benefits’ without compromising genetic resources.

Indeed these three objectives: 1) the conservation of biological diversity, 2) the sustainable use of its components and 3) the fair and equitable sharing of benefits arising from the use of genetic resources were the major aim of developing country negotiations that led to the development of the widely heralded Convention on Biological Diversity. The CBD arose out of the anthropocentric concerns of the two fold realization for the value of biological resources to humanity’s economic and social development, and the increasing rate of species extinction due to anthropogenic activities. This in turn led to the adoption of the CBD in 1992 at the Nairobi Conference and its’ opening for signatures at the UNCED United Nations Conference on the Environment and Development (The Rio Earth Summit) later that same year. One year later, 168 countries had signed on and the CBD entered into force in December 1993. In deed these three

³ International Union for the Conservation of Nature

objectives marked a dramatic step forward in the shaping of national legislation with regards to genetic resources.

4.2.1 The Convention on Biological Diversity

The CBD is now one of 4 major instruments that directly relate to genetic and biological resources. The others being the Union for the Protection of Plant Varieties (UPOV), the International Undertaking for Plant Genetic Resources (IUPGR) and the Trade Related Aspects of Intellectual Property Rights of the World Trade Organization (TRIPs/WTO). However, although subservient to national interests, the CBD, unlike the UPOV and TRIPs signals the importance of indigenous and local knowledge for the achievement of its goals. The widely cited Article 8j of the CBD and the less referred to Article 10c point to I&LK as important aspects of *in-situ* conservation strategies and the sustainable use of components of biological diversity.

Article 8j states that each contracting party as far as possible and as appropriate shall:

Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices (CBD, 1992).

Likewise, Article 10c states that contracting parties shall: “Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements” (CBD, 1992). Although the inclusion of such notions into national access legislation could provide I&L communities with greater control over genetic and biological resources on the lands they inhabit or use, it could also work to undermine their customary use of such resources. Glowka challenges member states to move beyond simple assertions of their sovereign power (as highlighted in such conventions) over persons seeking access to genetic information, and argues that, “States can also exercise their sovereignty constructively by providing the legal basis for communities to better control their knowledge”

(Glowka, 1998:37). Such a challenge implicitly calls for separate legislation for the protection of I&LK.

While at the global level the implementation of Articles 8j and 10c have been and continue to be dealt with in various civil society forums such as the Convention of the Parties (arising out of the CBD), the UN Working Group on Indigenous Populations, the Draft UN Declaration on the Rights of Indigenous Peoples, the International Undertaking of the FAO on Plant Genetic Resources (IUPGR) that seeks to promote Farmer's Rights and Human Rights Declarations, the private sector has also risen to some of these challenges. Several companies and indigenous and local groups have already begun to define guidelines for access to genetic resources. The Forest Healing Conservancy (FHC) (the not for profit branch developed by Shaman Pharmaceuticals) and the International Co-operative Biodiversity Groups (ICBG) Program of the University of Georgia, and research institutes such as the National Cancer Institute (NCI) and the National Health Institute (NHI) both of the US and University of California Davis to name a few, have been lauded for their initiatives in the development of research guidelines and policies that take into account various principles such as the prior informed consent of indigenous and local communities and the equitable sharing of benefits (Cragg, 1994; Gamez, 1993; Green, 1999; Gupta, 1997; King, 1994; Kothari, 1996; Moran, 1994; Science, 1999). Indigenous and local groups such as the Inuit Tapirisat, the Dene Cultural Institute, and the International Institute of Rural Reconstruction to name a few in the Canadian context, have also developed guidelines for research with and among indigenous communities (Grenier, 1998). Although such guidelines have raised concerns (at least with regards to the non-indigenous formulations) as driven by self interest, promoting commercialization and bilateral negotiations and questionable in terms of the reciprocity of the actual process, they are an important step (particularly with regards to those developed with the involvement of the

indigenous peoples from the beginning) towards meeting some of the principles that have emerged both internationally and locally.

4.3 *The Influences of Emerging Principles and Obligations*

Emerging principles and obligations such as conservation and the equitable sharing of benefits continue to be grappled with in recently developed and developing access legislation. Although some have argued that they seem to be largely framed by commercial interests, this may be changing. In 1995, The Philippines Presidential Executive Order was the first access regulation to be adopted by a developing country. "It requires prospectors to negotiate a research agreement with the government, and to seek prior informed consent and to share benefits with national stakeholders such as local communities and indigenous peoples" (ten Kate, 1995). Although exemplary in terms of its implementation of Article 8j, the Philippine approach has in many ways been an example of a restrictive approach that has in fact inhibited private investment. As a result it has had little experience in the establishment of bioprospecting agreements with international corporations" (Solleiro, 1998). Subsequently, much of the legislation to be developed in other developing countries has tended to reflect commercial interests more strongly.

For example, Costa Rica, along with the Andean Pact Countries, Bolivia, Columbia, Ecuador, Peru and Venezuela have been criticized for their commercial orientation. Although the Andean Pact Agreement 391 acknowledges indigenous peoples contributions, and requires their PIC and involvement in benefit sharing agreements, it is held as secondary to the PIC of the nation state, with the initial agreement developed solely between the state and the interested third party. While the World Conservation Union (IUCN) and the Peruvian Centre for Environmental Law prepared a draft directive for the access to genetic resources that emphasized equitable

sharing of benefits with I&L peoples, the *Junta del Acuerdo de Cartagena* (JUNAC), the administrative body of the Andean Pact, which commissioned the draft was criticized for its lack of consultation with the individual countries. The overall discussions at the subsequent meeting held in Columbia in 1994 brought out the overall nationalistic positions of member countries, and the emphasis on commercial as opposed to conservationist interests (Jaffé, 1994). These national perspectives, in fact demonstrate that much of access legislation has been formulated around commercial interests. Some would argue that it is in fact the private sector that is at the heart of the development of access legislation (Glowka, 1998). However as more recent trends suggest, this climate, may in fact be changing.

In an attempt to mitigate such barriers to trade, access legislation has continued to developed in an attempt to achieve a better balance between conservation, business promotion and benefit sharing (Solleiro, 1998). In a brief review of Latin American developments, José Luis Solleiro draws attention to the experiences of countries such as Costa Rica, which without the development of any specific legislation has 'promoted pioneering agreements' that have promoted the principles of benefits sharing and conservation. Although it has been recognized that Costa Rica may have placed greater emphasis on commercial interests⁴, the recent emphasis on the capacity building of local farmers and the drafting of regulatory laws pertaining to biodiversity demonstrate its more recent shifts away from commercial interests. Likewise the Andean Pact Agreement, although criticized, as outlined above, for its emphasis on the sovereign rights to genetic resources, has an important annex under Decision 391, that recognizes the rights and interests of the suppliers of genetic materials, and calls for a fair and equitable sharing of the benefits derived from their use. Perhaps the most balanced access proposal in the Latin American context, is the initiative for the Access to Genetic Resources Bill in Brazil. This

⁴ The National Biodiversity Institute (INBio), Costa Rica's private, not-for-profit institution in charge of regulating access to the nation's wealth of biological diversity, has come under fire for laying claim to what is seen by some as national heritage (Solleiro, 1998).

proposal draws upon LA country experience and consults indigenous communities in an attempt to weigh such interests against commercial ones. Unlike Costa Rica, Brazil does not include restrictive biosafety regulations, nor does it restrict the granting of IPRs (which would be against the TRIPs). More importantly to this research, it has introduced the theme of 'collective intellectual property rights', in reference to I&LK. However, as Solleiro points out, "...it does not give any provision on how to regulate and operationalize these rights..." (1998:1132). Hence one might argue that a full circle has been made back to the provisions of the Philippines Executive Order that sought to take I&LK into consideration. Perhaps what is different is that under the guise of 'collective IPR' the protection of I&LK will not run counter to the principles of conservation nor inhibit commercial interests. The Brazilian example is in fact reflective of countless other proposals that have pointed to collective intellectual property rights. With regards to the protection of I&LK and genetic resources, the majority of the draft proposals put forth, either call upon the existing IPR regime or propose an often vague and sometimes ill defined collective IPR alternative. The following section will first explore some of the evolution's in the IPR system, up to current *sui generis* IP proposals before exploring the various proposals put forth for collective IPR.

Although the more effective use of contractual arrangements and the development of guidelines ensuring that third parties secure prior and informed consent before attaining access to I&LK can be an important part of a 'web' of strategies, the development of hard laws have also given form to and supported various developments in the field of IPR. Indeed as elaborated by Dan Leskien and Michael Flitner in an IPGRI publication: "Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System": "Apart from the minimum requirements laid down by the TRIPs Agreement, any *sui generis* system should also take into account the objectives of other international treaties and/or emerging principles of the

international community, especially those dealing with plant genetic resources and Traditional Resource Rights (TRR)” (1997: 33).

4.4 *Sui Generis* Legislation

In this sense, *sui generis*, as narrowly defined by the TRIPs as a minimum requirement, compliant with the principles of national treatment and most-favoured nation treatment must be an IPR⁵. The authors highlight that although the term has no uniform definition it is used to often refer to a system embodying farmers’ and indigenous peoples’ rights and/or an alternative rights regime for the protection of community innovations not protectable under conventional IP laws. Leskien et.al. go on to list the various multilateral treaties and soft laws that set obligations and accepted principles, providing a wide range of instruments for the relevant shaping of a *sui generis* system. Although it is not within the scope of this thesis to go into the details of the development of various *sui generis* systems, it is important to note that pursuant to the TRIPS Agreement, all members shall provide patent protection for any inventions, product or process in the fields of technology, with the exclusion from patentability of plants and animals other than microorganisms. That being said, all members must however, “provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof”. These requirements, Leskien et.al. suggests should be balanced with the obligations of the conservation and sustainable use of biological diversity and the equitable sharing of benefits with knowledge holders as stated in Article 8j of the CBD, and other obligations, such as the notion of sovereign national rights over natural resources, the encouragement and protection of I&L knowledge, innovation and practices related to genetic resources, the recognition of farmers’ rights, access to genetic resources subject to prior informed consent (PIC) and mutually agreed

⁵ IPR in this sense refers to the legally enforceable right that excludes others from certain acts in relation to the plant variety or limited to certain uses for remuneration by 3rd parties.

upon terms and the sharing of not only benefits from the commercialization of genetic resources but the sharing of results from R&D arising from its utilization.

4.5 *Intellectual Property Protection for Indigenous and Local Knowledge*

Recently attention has been focused in various realms on the use of current intellectual property right mechanisms for the protection of I&LK. In the international forum the recent "Roundtable Workshop on Intellectual Property and Traditional Knowledge" held by the World Intellectual Property Organization (WIPO) in Geneva, highlighted the very issues of IP mechanisms for the protection of I&LK (WIPO, 1999). Likewise workshops such as the "Inter-American Workshop on Intellectual Property Rights as Applied to Indigenous Women's Art Design" held in Canada in April of 1999 and the publication of a working paper entitled: "Intellectual Property and Aboriginal People" put out by the Department of Indian and Northern Development in Canada (DIAND, 1999) are only a few of the ongoing activities that are focusing on the application of IPR to indigenous and local knowledge. While the use of IPR for the protection of I&LK, has received a fair amount of criticism as outlined above, the IPR system has not been a static entity as such critiques may imply. It would be useful at this point to briefly outline the historical evolution of IPR with regards to plant genetic resources and I&LK.

4.6 *A Brief History of IPRs and Plant Genetic Resources*

Although the debate over monopoly rightstook place much earlier,⁶ the oldest form of intellectual property is commonly held to date back to the Venetian decree of 1474 (whereby the City State of Venice established the first patent law. As such, it was argued, that a temporary monopoly would aid in the development and introduction of new technologies and ideas (WIPO:1999). The industrial application of intellectual property grew to include living

⁶ Some would say to the rejection of the concept in 480 by Emperor Zeno of Rome (RAFI:1994).

organisms in various instances such as the granting of a patent on yeast culture to Louis Pasteur in 1873. However IPR for genetic and biochemical resources really began to formally expand in breadth and scope in the 1930s with the passing of the US Plant Patent Act in 1930 which allowed for the patenting of asexually reproduced plants such as roses and other ornamentals and fruit trees. In the 1940s European countries established Plant Breeders' Rights (PBR) for the protection of sexually reproduced plants and in 1970 the US followed suit with the passing of the Plant Variety Protection Act (PVP). Prior to the PVP Act, however, the International Convention for the Protection of New Varieties of Plants (UPOV Convention) was adopted in order to address various issues arising from the increasing international trade in species protected by PBRs. Both UPOV 1978 and the later UPOV model of 1991 provide plant varietal protection to plant breeders for the full disclosure of a new variety that meets the requirements of distinct, useful and non-obvious.

With the exception of early patents like Pasteur's, IPRs granted for plants and animals were not formal 'utility' patents. In fact it wasn't until 1980 when the US Supreme Court granted a utility patent in the case of *Diamond vs. Chakravarty* for a genetically altered bacterium that the flood gates were opened for the patenting of living organisms. Neither PBRs nor Plant Patent Legislation require the same standards of novelty, utility and non-obviousness (to the average person skilled in the art) and therefore do not provide the same amount of protection that a utility patent does. Although today countries differ in the IP protection they offer for living organisms⁷, the scope of intellectual property rights at a global level has greatly expanded for 'improved' genetic resources in the past Century. The same cannot be said however, for 'unimproved' genetic resources that retained a 'common heritage' status until the 1980s. Hence in the 1970s concerns were raised in international fora to the growing institutional access to these

⁷ Whereas the US grants patents on novel DNA sequences, genes, plant parts, plant or animal varieties and biotechnological processes, European countries only recently extended IPRs to plant varieties.

'unimproved' resources. It was argued, that in fact while formal breeders were receiving IPRs for their 'improved' varieties, informal breeders such as indigenous and local farmers could not receive property rights for the 'unimproved varieties' that in many cases they had selected and bred (Fowler, & Mooney, 1994). The question that arose was why I&L peoples weren't getting acknowledgement for their contributions while plant breeders were, or rather why were plant breeders getting such rights in the first place?

The ensuing 'seed wars' that followed in the 1980s led to the development of a commission on plant genetic resources set up through the United Nations Food and Agriculture Organization (FAO) entitled the: International Undertaking for Plant Genetic Resources (IUPGR or IU for short). Although the IU began with the premise that all genetic resources should be common heritage, due to the lack of support from countries with established seed industries the IU, by 1987 shifted focus to finding a balance between PBRs on the one hand and Farmers' Rights on the other. Farmers' Rights had been proposed as a counter point to PBRs which generally provided limited rights to an individual or corporation for plant varieties that met the DUS requirements: Distinct, Uniform/Homogenous and Stable. Farmers' Rights on the other hand would provide communal rights vested in the international community through the IUPGR that would recognize the contributions of I&L farmers through a fund for plant genetic resources.⁸

The discussion regarding ownership and access to genetic resources largely shifted from a debate surrounding the notion of genetic resources as a 'common heritage' within the IUPGR to one of biodiversity as a sovereign national resource and a 'common concern' to humanity. This debate was brought to the CBD in 1992. Hence, one might argue, that recent discussions of IP as

⁸ As most countries have only contributed a token amount to the Fund for Plant Genetic Resources, it has largely been perceived as unsuccessful (Reid, Walter, et.al., 1993; Crucible II: Forthcoming).

a free market mechanism allowing for the development and introduction of new technologies and ideas as embodied in genetic resources have been girded by the requirements of the TRIPs regarding plant varieties on the one hand, and the obligations as outlined in multilateral treaties such as the CBD.

The recent development of draft *sui generis* legislation in various parts of the world has in many respects continued to reflect the ongoing debate surrounding IPRs. While most developing countries have opted for UPOV 1991, several have put forth alternative proposals that demonstrate a more encompassing approach to the protection of the rights of I&L communities. For example, indigenous plant varieties are given protection in Section 45 of the recently developed Draft Legislation in Thailand that possess distinctive and consistent traits. This may demonstrate a broadening of the acceptable limits of heterogeneity within a plant grouping which will allow for a shift from “The widely applied DUS requirements (that) may seem justified to clearly define the protectable subject matter of any PBR system, but create incentives of the unnecessary and sometimes dangerous uniformity and (tends) to exclude any heterogeneous groupings of plants, which is problematic with regard to conservation and sustainable use of agricultural diversity” (Leskien, et.al.1997:54).⁹ Leskien et.al. goes on to refer to an example from Switzerland, whereby a ‘second register’ has been set up for landraces (or highly heterogeneous groupings of cereals (1997). Likewise under Article 6 of the Convention of Farmers and Breeders (CoFaB) points to broadening of plant breeders rights to a sufficient

⁹ Research in the field of genetic resources highlights the need to support indigenous and local communities as the primary caretakers of genetically variable resources. Studies such as Hope Shand’s publication, *Human Nature*, demonstrate that the small number of species relied upon by the global population as demonstrated by the FAO *State of the World’s Plant Genetic Resources for Food and Agriculture* grossly underestimates the actual diversity of the world food supply. As Shand states: “A very different picture would emerge if we were to look into women’s cooking pots and home gardens of poor people in the South and if we could survey local markets and give special attention to household use of non-domesticated species” (1998:1). Trends towards *in-situ* conservation and participatory plant breeding in agricultural research reflect the recognition of and the importance for I&L informal breeding techniques for the conservation of the earth’s biological diversity. However, the legal mechanisms that support formal breeders do not reflect this widely held vision.

homogeneous base and states that: “Without any prejudice to the quality and reliability of the new variety, breeders of new varieties shall try to base the new variety on a broader rather than narrower genetic base, in order to maintain greater genetic variability in the field” (December 1998). In the spirit of the IU, CoFaB also underlines that a National Gene Fund be set up in recognition of the rights of farmers for the use of landraces and or traditional varieties either directly or indirectly (eg. the use of varieties that have arisen from landraces). While these proposals demonstrate that there is somewhat of a trend towards the broadening of requirements for plant varietal protection, so as to include indigenous and local farmers, they do not necessarily respond to the demands for collective intellectual rights. Various *sui generis* proposals, point to a more encompassing alternative system. We turn now to the concepts of Traditional Resource Rights and Community Intellectual Rights, two such proposals.

Although the use of existing IPR mechanisms have recently received more attention as a protection mechanism for I&LK, a number of commentators have argued for the development of *sui generis* systems designed specifically for the protection of I&LK associated with genetic resources. Such systems would move beyond the current IPR system that does little to capture these different kinds of knowledge. In many ways, the CBD and various indigenous declarations have provided the conceptual underpinnings for the *sui generis* systems proposed. Recent draft legislation such as the Brazilian proposal outlined above, and the Draft Model Legislation for African Countries on Community Rights and Access to Biological Resources¹⁰ are only two

¹⁰This model was put forward by the Scientific, Technical and Research Commission of the Organization of African Unity (OAU/STRC) in March of 1998 and strongly “...recommends that OAU/AEC member states urgently make legislation to regulate access to biological resources, knowledge and technologies so that such access shall be allowed only with the prior informed consent of the local communities and the State and shall benefit them, and to recognize community rights in order to protect the heritage of the people of Africa”. In contrast to this proposal, another meeting shortly followed whereby OAU country members discussed UPOV 1991 as a viable alternative to the protection of farmers’ varieties (IATP, 1998). UPOV 1991 unlike UPOV 1978 leaves it up to member countries to ensure that farmers can plant back protected varieties. RAFL stresses that OAU countries are condemning their farmers by accepting UPOV 1991(RAFL, 1999).

examples of proposals that seek protection for I&LK beyond that provided by IPRs. It is these proposals that are central to a discussion of Registries.

4.7 *Traditional Resource Rights*

What has been heralded as one of the most promising proposals for the protection of I&LK is the concept of Traditional Resource Rights. The term TRR was developed by Darrell Posey as an “integrated rights concept” that would move beyond the constraining and sometimes incompatible notions of property, and allow for the recognition of the inextricable links between cultural and biological diversity (Posey, 1996). As such TRR has emerged to underscore the many ‘bundle of rights’ that Posey argues can be used for protection, compensation and conservation. These conceptual underpinnings in part grew out of and/or complement the work undertaken within the Working Group on Indigenous Populations of the UN-Sub-Commission on the Prevention of Discrimination of Minorities. It is posited that TRR can be implemented locally, nationally and internationally and that it can also guide international law and practice and national legislation. TRR also guide dialogue and negotiations between local and national stakeholders that will support the development of innovative contracts that take on a more holistic approach to notions of sustainability. Finally as Posey states: “TRR go beyond other sui generis models in that they seek not only to protect knowledge relating to biological resources but also to assert the right of peoples to self-determination and the right to safeguard ‘culture’ in its broadest sense” (Posey, 1996:95).

4.8 *Community Intellectual Rights*

Similarly, in the spirit of a shift from notions of property and in particular intellectual property rights, the Model Community Intellectual Rights Act, was proposed in a Third World Network discussion paper (Nijar, 1996). Arising out of an ecological movement in India

whereby farmers sought the protection of their knowledge under collective intellectual rights as a way of recovering the biodiversity commons, the concept was developed into a model law that would bring about the evolution of a new criteria for claiming patent rights that would be compatible with I&L peoples cultural values and practices. The driving argument behind the notion of CIRs that I&L communities should be able to positively assert their right over collectively held knowledge through the demonstration of novelty outside of the I&L community. Hence their accumulated knowledge, largely unknown to the outside world would be protected. Through either the development of a constructive trustee at the local level or a higher trust at the state or national level a legal base would allow for the vesting of custodianship rights of an innovation in the local communities themselves. The model CIR act goes on to suggest that in the interim communities engage in the creation of the registry of invention and or the development of the community register.

The Community Intellectual Rights Act, in an attempt to redefine what is considered as innovative in a way that reflects I&L community perspectives. In his proposal to TWN, Nijar outlines the flaws of the current IPR system, which he argues are ‘...self-serving definitional construct’. He goes on to say that “...these conflicts as to what can and cannot be recognized as ‘creative’ and ‘innovative’, represent a clash of the definitions of knowledge systems. The present uni-dimensional definition simply cannot be accepted as it allows for the usurpation of traditional manoeuvres. It reduces the pool of human cultures by a reductionism which denies recognition of the diverse and varied knowledge systems of indigenous peoples and local communities” (1996:28). Nijar goes on to reformulate a definition of innovation which will acknowledge I&L systems of knowing. As such he defines innovation to:

...include collective and cumulative knowledge or technology of the use, properties, values and processes of any biological material or part thereof, rendered of any, or enhance, use or value as a result of the said cumulative knowledge or technology whether documented, recorded, oral, written or howsoever otherwise existing including any alteration, modification, improvement thereof; and shall also include derivatives which utilize the knowledge of local communities in the commercialization of any product as well as to a more sophisticated process for extracting,

isolating, or synthesizing the active chemical in the biological extracts or compositions used by the local communities (1996:56)

He goes on to define that the 'local community' eligible for protection of their innovations in perpetuity, "...refers to a group of people having a long standing social organization that binds them together whether in a defined area or howsoever otherwise and shall include indigenous peoples, farmers, and local populations, and shall where appropriate refer to any organization duly registered under the provisions of this Act to represent their interest" (57). Finally, Article 5 of the Act points to the Registry of Invention (ROI) as the mechanism by which 'local communities' can protect their 'innovation'. With the additional clause that "...non-registration will not mean that the community was/is not the custodian or steward of the innovation..." (60). The Act in many ways goes beyond other model proposals. The clear definitions of indigenous and local and what constitutes protectable subject matter, generally unheard of in much of the legislation, and the identification of a mechanism for the undertaking of the proposal are truly groundbreaking.

4.8.1 Registration of Invention

Both TRRs and CIRs clearly mark a shift from the discussion of I&LK as confined within an intellectual property rights framework. However, as conceptual proposals, it has been argued that in terms of their implementation, they may take some time even being accepted globally. The Crucible II however, has clearly identified the Registry as part of a possible *sui generis* IP strategy, and has recommended the Registry as a possible non-IP mechanism for the protection of I&LK. The Registries currently underway not only support the concepts of TRR and CIR, and may in fact facilitate the development of supporting legislation, but they provide an alternative that supports decentralized community and resource management. The Registry, it is held by proponents, is in fact representative of a mechanism for the implementation of the emerging principles and obligations explored above.

The history of our people needs to be told. We need to present accurately what happened in the past, so that we can deal with it in the future... I don't like what has happened over the last 500 years. We can't do much about that. But what are we going to do about the next 500 years? What are we going to do about the next ten years? Georges Erasmus, Dene, 1990

If biopiracy is the Columbian 'discovery' 500 years after Columbus what can be done?

The preceding chapters have explored some of the central issues regarding the misappropriation of indigenous and local knowledge. Although it has been demonstrated that the current IPR system, reflective of western categories of thought has largely excluded indigenous and local knowledge due to various technical and ideological discrepancies, it does not follow that this system has necessarily been a static and monolithic entity. While IPR has adapted to include a broader spectrum of innovative knowledge, as was seen with the development of PBRs in the latter part of the 1900s, it has not opened its doors to the informal innovators found within indigenous and local communities. Proposals for collective intellectual rights that have developed outside of this system such as Farmer's Rights, TRRs and CIRs present concepts and models that may provide solutions for the protection of I&LK. Likewise the Registry may have emerged as a key mechanism to the unfolding of such proposals.

Chapter 5

The Community Resource Registry

The strength of 'slow' sciences lies in their enormous store of information of complex natural systems - be they human health or forest or pond ecosystems. That this great store of information is fuzzily defined and poorly organized is a weakness that needs to be overcome for it to claim its rightful place in human affairs. This is the task that the People's Biodiversity Register (PBR) programme attempts to take up" (Gadgil, 1998).

This statement, put forward by Madhav Gadgil, a researcher with the Centre for Ecological Sciences at the Indian Institute of Science in Bangalore, India, brings to light the nature of what the Registry is attempting to do. In the broadest sense, the Registry, is seeking to promote indigenous and local knowledge, or what Gadgil refers to as 'slow' science, to its 'rightful' place. Such a promotion, as introduced in Chapter 1, will, on the one hand ensure the protection of that knowledge from its continued erosion, and on the other, it will allow indigenous and local communities to assert greater control over that knowledge. While to date, the Registry has not been a widely researched topic, the following chapter will bring together some of the existing literature on the Registry, and information accumulated through e-mail correspondence with peoples involved in Registries in India. Chapter 6 will continue the exploration, by reflecting and drawing upon findings from my 6 week research trip to Ecuador. This research trip sought to explore the effectiveness of the Registry as an I&LK protection mechanism through an analysis of an IDRC supported and UNDP funded project entitled: The Project for the Recuperation and Development of Indigenous Knowledge for the Conservation of Ecosystems and Biodiversity in the Amazon Forest of Yana Yacu Sacha.

5.1 The Research Problem

Although the research problem in and of itself could largely be reflected upon without physically journeying anywhere, I had initially wanted to find out more about Registries from communities engaged in the process. Why were they registering their knowledge? How were they doing it? Who was involved in the registration process and how would the registry function to

'protect' their knowledge? Although various articles and project reports strongly indicated ongoing Registry activities in Ecuador, in reality I did not come across indigenous or local peoples undertaking Registration activities at the community level for the purposes of making a positive IP assertion, or inhibiting subsequent IP assertions. I did however come across 1) projects that sought non-IPR protection through documentation of knowledge and 2) a project now in its initial stages that seeks IPR protection through the conversion of *traditional knowledge into trade secrets* (a knowledge cartel). As a result of these initial findings, I pursued a more *theoretical* discussion on the protection of indigenous knowledge. My interviews were conducted with environmental, legal and indigenous organizations in an attempt to chart out the current perspectives and strategies for the 'protection' of indigenous and local knowledge and to understand the proposal for a *knowledge cartel* in more detail.

Although Registries may be more widely prevalent than what is explored in this chapter, this preliminary research indicates that the emerging network of Registry activities, while gaining increasing popularity in the past decade, are clearly different from other non-Registration activities that simply document knowledge for one reason or another. Central to this difference is the necessary distinction between documenting knowledge in order to sustain claims over that knowledge (either through positive assertions, or defensively). Furthermore this research reveals that the Registry manifests itself as either: 1) a decentralized and public database or 2) a centralized and private database. While these categories are not necessarily commonly identified in the literature, or by those involved in Registry activities, they will be used in this thesis to better clarify important distinctions arising among and between Registry activities. As such, the three cases studies, 1) the Community Biodiversity Registers and 2) the Registry of Invention in India and the 3) Knowledge Cartel in Ecuador, that give rise to these categories, will be explored in greater detail.

5.2 People's Biodiversity Registers: The use of defensive publication in India

In India, what has come to be known as the Community or Peoples' Biodiversity Registers (PBR or CBR) has resulted in nation wide registration activities of I&LK at the local level. Although difficult to pinpoint, CBRs appear to have been initiated in 1994 by the Foundation for the Revitalization for Local Health Traditions (FRLHT) and the Centre for Ecological Sciences. CBRs are now being conducted by other institutes across India, such as the Swaminathan Foundation, the Nav-dhanya Program of the Foundation for Science and Technology and Ecology and the Nayakrishi Project in Bangladesh.

In 1994 a workshop brought together some of these various organizations to discuss the registration of knowledge as a mechanism for I&LK protection. From this workshop the Srusstigyann Manual was developed, which outlines the methodology for the participatory registration of information from everything about the landscape and resources to the resource users. Participatory workshops are run with the interested community that help to identify and document everything from 'landscape elements' & geographical elements, including all species known (named) and unknown (documented as existing) & their economic significance to the ecological history contained in the biota on indigenous and local community lands and territories (Rao, et.al, 1995). The CBR also documents various resource users, community and environmental concerns and aspirations.¹

The inspiration for this now wide spread initiative arose not only from the desire to protect, what is often referred to as 'community intellectual property rights', but it was felt that through a process of documentation, communities could also renew or develop resource

¹ In India, as elsewhere, the exercise has highlighted the need to move towards *in-situ* conservation strategies that are multisectoral, specific to the locality and adaptive to local peoples management of biodiversity. The People's Biodiversity Register it is hoped, will eventually be accepted by the state and central government as a tool for participatory, decentralized and sustainable development. The PBR it is held by its advocates, is an appropriate instrument for the implementation of the Convention on Biological Diversity and Agenda 21.

management strategies (Kothari, et.al., 1996), development aspirations and pride in community knowledge and scientific abilities (Gupta, 1998; Nijar, 1996). However, perhaps what sets this initiative apart from other conservation and resource management activities is that the CBR also seeks to defend and assert community rights over knowledge through defensive publication, and the creation of *sui generis* IP protection for this knowledge.

5.2.1 Defensive Publication

Defensive publication is an interesting option for those interested in keeping others from patenting an innovation, but who are not interested in obtaining a legally enforceable monopoly. In this sense, defensive publication has been termed a 'non-patent patent', as Registry members publishing in the Registry could inhibit subsequent inventions filed after that date without making a positive assertion over the registered knowledge (Crucible, 1994).² Defensive publication is in fact a perfect example of the ambiguous distinction between the suggested IP and non-IP categories, in that although not specifically an IP mechanism, in the way that patents, copyright, trademarks and trade secrets are, neither does it fall neatly within the non-IP continuum.

In order to establish a patent claim it is essential that the inventor demonstrate, among other criteria, that the innovation does not already exist within the public domain. Although the criteria for establishing *prior art* differs from country to country, generally speaking, a patent agent performs a search to determine the novelty of the proposed patent. If the knowledge already exists within the public domain, the patent may not be granted, or the patent lawyer, may have to draft the patent application in a way that demonstrates the novelty of the patent in question. Conversely a patent can also be defeated through the demonstration that the innovation

² Statutory Invention Registration allows rival inventors to allege prior invention to the date of publication. An 'interference' is then run by the Patent Office that explores the details and dates of the research, not merely the date of publication. In the context of International Agriculture Research Centers (IARCs) it was argued that this kind of defensive publication would be extremely useful as only one application is necessary for a large acquisition and subsequently published material would be then part of required patent office search in establishing prior art (IDRC, 1994).

had already existed in the public domain. Hence a sort of monopolistic and/or oligopoly right is asserted over knowledge in the Registry. The Registry, it is argued by its advocates, will be able to establish *prior art* through the act of defensive publication. I&LK which may have formerly been maintained orally will now be documented as proof of prior existence and patent claims such as the Neem patent would be defeated. Both SRISTI and the Community/People's Biodiversity Registry Initiatives seek to defensively obtain IPR protection over registered knowledge through establishing prior art through the publication of knowledge. By extension, one could argue that any initiative that documents knowledge could in fact use the same mechanism for I&LK protection.

5.3 Registry of Inventions: The case of SRISTI in India

The Society for Research and Initiatives for Sustainable Technologies Institute (SRISTI) and Honeybee Network also in India, have been involved in the documentation and further experimentation and dissemination of I&L innovations and practices in animal husbandry and agriculture for nearly 16 years. Through the publication of I&L innovations they seek to promote and protect I&LK. They have also been involved in a variety of methods of documentation and have registered over 5300 innovations and practices from 2300 villages in India, and from other parts of the world (SRISTI, 1999). SRISTI defines protectable subject matter through the identification of innovations both collective and individual. Furthermore it functions on the premise that not all I&LK is communal or traditional. Therefore it is imperative that protection of I&LK reflect the individual and /or community origin of an innovation that could in fact be a contemporary manifestation of a traditional concept.

The SRISTI Registry of Invention, a decentralized, public database and network at the national level, primarily seeks recognition for grassroots innovators through publications and symposiums. It also promotes conservation of knowledge and knowledge systems and the

promotion of information flows and continued innovations. SRISTI also seeks to establish claims and subsequent benefits for individual and or community knowledge of biological resources and the derivation of benefits. As Anil Gupta, the founder of SRISTI claims, “The farmers, indigenous people, artisans etc. are almost never acknowledged in any discourse on their knowledge in a manner that can be identified...” (Gupta, 1999). “...we have to discuss the issue of recognizing, respecting and rewarding the contribution of local communities” (Gupta, 1994). He proposes a variety of ways in which individuals and or collectives can receive material or non-material benefits for their knowledge while providing incentives for continued innovation.

Table 1: Incentive Matrix

	Material	Non-Material
Individual	Property Rights, IPRs, Money, Fellowships	Documentation, Press, Title, Fame
Community	Risk/Trust fund, Community Awards, Grants	Increasing control over natural resources, self-determination, favourable policy

Source: Adapted from Gupta, 1999

Although SRISTI is actively seeking IPRs for I&L innovations, through the use of mechanisms such as petty or utility patents and PVP rights, it is also attempting to redefine the meaning of ‘innovation’ in a way that reflects contemporary I&L communities.

5.4 The Knowledge Cartel: A Latin American initiative for the conversion of ‘traditional knowledge into trade secrets’

Finally, one proposal for the use of the Registry for IP protection is the formation of a regional *Knowledge Cartel* in Latin America. The project entitled: *From Traditional Knowledge to Trade Secrets*, arose from a proposal put forth by J. Vogel³ and is currently in the initial stages of its development (Vogel, 1996). The project, currently run by Ecociencia, an

³ His upcoming publication: *From Traditional Knowledge to Trade Secrets* outlines his proposal in detail.

Ecuadorian Environmental NGO, seeks to manage traditional knowledge in confidential data banks in order to negotiate access to the knowledge as a trade secret at a regional level. The project has already begun to create the GIS database system for the knowledge management and has also published 6 paralegal manuals that seek to build community capacity for the organization, creation and management strategies for the sustainable use of biological resources. The sixth manual specifically explores the issues around biodiversity and IPR, outlining existing IP mechanisms for knowledge protection and specifically highlighting the Registry as the best method for I&L knowledge protection (Morales, 1999).

The basic rationale for the Cartel rests on the economic premise that bioprospecting has not been a lucrative industry for the suppliers of raw material due to the high levels of its supply of the raw material resulting in high competition and lower prices. Hence Vogel proposes that the rationale for monopoly rights over biotechnology due to the expense of research, the ease of reproduction and lack of exclusionary mechanisms, be extended to oligopoly rights. In the case of bioprospecting, such rights would extend over biological diversity (Vogel, 1999). Vogel further suggests that national IPR law be amended to require certificates of origin on all products that utilize biological diversity, a scientific mechanism to determine the range of habitat for taxa registered and a clearing house mechanism to identify range of taxa to identify common knowledge holders. Furthermore he proposes the establishment of a fund to receive 15% royalty on net sales of biotechnology using registered biological diversity. This money would then be distributed to cartel members ranked according to knowledge. While this proposal may encourage bioprospecting, Vogel proposes an incentive for ethnobioprospecting that breaks the 15% down for distribution to intermediaries, distinguishing between member country and member community.

The next phase of this project will prepare paralegal co-ordinators to initiate information workshops that raise awareness in I&L communities to the issues regarding bioprospecting,

intellectual property rights and the use of the Registry for the protection of those rights.

Subsequently through interviews with individual informants, Ecociencia will catalogue I&L knowledge related to medicinal, non-medicinal and shared categories,⁴ which will then be transferred into databases either managed by each community or located in universities or NGOs.⁵ The database, (currently being created) will restrict access to I&LK through the definition of different levels of participation. These levels are reflective of an administrative and centralized vision of the database⁶ that will ensure that the I&LK registered in the system is kept confidential (Saens, 1999). Indigenous and local communities under Ecuadorian law could then make a claim for the protection of their knowledge and know-how as a trade secret.

5.4.1 The Trade Secret

⁴ Two forms for the collection of ethnobotanical information (med and non-med plants) have been created by Ecociencia as a result of 20 years of ethnobotanical work with indigenous communities in the Oriente. The forms will be completed through interviews with single informants from various communities. The non-medicinal form provides information on the name of the collector, informant (name, age, gender, profession, ethnicity, name of community, province, canton and paroquia) the form also provides information on the exact site of collection (GPS, maps, longitude, latitude), species, information regarding the informant, zone cultivated or non-cultivated, type, management, use (artesinal, cosmetic, mythic, ornamental, edible, construction, agricultural, hunting or for the house and whether it is used on a human or animal and local name of use and the part used. Information is also included on the preparation and geographic uses, information on the flower and or fruit and period of floration/frutacion, active principle and other literature it is sited in and bibliographic references. Except for the last two points and the GPS positioning the information collected on this form represents the informants perspective.

The medicinal form explores much the same information but asks for more specific information such as the local name for the illness and the occidental name for the illness, its action (anti-inflammatory, disinfectant, sleeping drug, relaxant, purgent, blood clotter, anti-malarial, tranquilizer, dewormer, cold remedy, energizer, tonic, aphrodisiac, anti-contraceptive or cleaner), the part used (all of plant, root, stalk, trunk, leaves, flowers, fruit, heart or head, milk, resin, gum, bark, tuber, seed or rizome) form of use (crude: ingest: juice of plant, portion, drops, or bath, plaster or poultice, washing, rubbing, or cooked: ingest: infusion, portion, puree, or vaporization, bath, plaster, rubbed or faumento). Finally information is added on the preparation (explanation, posologia, contraindications) and the age level and place of uses along with the thermic quality of the medicine (hot or cold).

⁵ There appears to be a discrepancy between Dr. Vogel's proposal which indicates community control over databases and perceptions of the current managing organization, (Vogel, 1997) Ecociencia which indicates a more centralized management system that may even be coordinated by a government body (Interview with Ecociencia 21 September 1999).

⁶ Level 1 refers to the physical restriction of the computer itself (where the computer is kept and who has access to it), Level 2 will limit entry to the computer (password), Level 3 will restrict the program (program password), Level 4 will restrict the database archive with a password and finally Level 5 will restrict the access at user level (the password will change periodically, users will have certain access abilities depending on their involvement with the program).

Although the trade secret represents what Vaver refers to as a kind of “...twilight zone...a mishmash of contract, equity, and property law” (1997:5), it is generally employed for the confidentiality of commercially related knowledge held between a few individuals (eg. the recipe for Coca Cola). Subsequent agreements between the ‘knowledge holders’ and interested parties would be negotiated in order to respect confidentiality. Although independent discovery by outsiders, whether it be accidental, through actual disclosure or reverse engineering, would be perfectly legal, taking the information without the consent of the knowledge holders would allow for legal action to be taken. The individual or company might then be obliged to share in the profits. Clearly the purpose of the Registry in the case of the Cartel proposal in Ecuador is to establish knowledge that is shared by I&L communities at a regional level that is not yet public, in order to negotiate the knowledge as a trade secret in a Material or Information Transfer Agreement between the knowledge holders and the interested party.

5.5 *Emerging Distinctions: Defensive Publication and Trade Secret*

Although most of these projects may seek some form of *sui generis* IP protection and/or non-IP protection for indigenous and local knowledge, it is clear that the use of existing IP protection mechanisms have also arisen. At one end of the IP spectrum, the Knowledge Cartel in Ecuador seeks to use the Registry for trade secret protection, while at the other end, the Registry, as in the case of the Community Biodiversity Registry, rejects IP protection through the use of defensive publication. The Registry of Invention in India explores possibilities along the entire continuum from attaining PBRs and other IP mechanisms to non-IP protection mechanisms,

It would be useful to clarify at this point that in the case of the Registry in India, and by extension one might argue, any publication of knowledge, the IPR mechanism (as a legal entity) is rejected through defensive publication. This refers to the establishment of prior art through the

publication of knowledge in order to defeat subsequent patent applications for the same or similar knowledge. However, both the CBR and Registry of Invention projects seek supporting legislative measures for the positive assertion of collective IPR. The use of the trade secret, however, as in the Ecuadorian case, would employ the intellectual property right for confidentiality of knowledge.⁷ Interestingly, in one sense, defensive publication, although not formally accepted as an IPR, acts as more of an IPR than the trade secret. In the first place, the trade secret does not require disclosure of knowledge. Hence the commercially related knowledge never enters the public domain. Whereas with defensive publication, the intent is to publicize the knowledge. However those engaging with the latter still seek some kind of monopoly or in the case of group registration, oligopoly rights to that knowledge.

Evidently the increasing trend towards the documentation of I&LK has been the result of concerns over the protection of that knowledge. Protection in the case of the Registry clearly refers to anything from the protection of the continued loss of biological diversity and associated knowledge, to protection of I&LK through the assertion of control of I&L peoples over that knowledge. In the cases described above, it is through the use of existing IPR mechanisms such as the trade secret and counter-IP mechanisms such as defensive publication, that I&LK may be protected. The use of different mechanisms highlights the emergence of strong distinctions between various Registry initiatives. On the one hand we have the development of what could be considered as decentralized and public databases, while on the other, we see the trends towards centralized and private database Registries.

5.5.1 From Decentralized and Public to Centralized and Private Databases

⁷ Trade secret refers to the confidentiality of commercially related knowledge held between several individuals.

Initiatives such as the Registry of Invention and the CBRs in India clearly seek to publish their knowledge in decentralized and public databases. Central to this objective, is that these endeavours wish to promote the availability of information flows to and from I&L communities. As is stated in the Srusstigyan Manual, “Even today such information about 7500 flowering plants collected from people all over India already exists in published literature and reports for limited circulation. However, it is available mostly in global information systems on computer networks such as the Internet. Modern pharmaceutical enterprises and seed companies also have their own ongoing programs for acquiring such information. On the other hand, this information is not available to the villagers at the level of collection of the raw resource directly from nature” (1994:2). Likewise the SRISTI, Gujarat Grassroots Innovations Augmentation Network (GIAN), continues to “...function as a knowledge hub connecting grassroots innovators to financial resources and entrepreneurial spirits that would facilitate the commercialization of the innovations” (GIAN, 1998-99:4), through the publication of innovations as described above, and through networking workshops such as the “Workshop for Lateral Learning among innovators artisans and farmers” held in India in May-June 1997, and a “Panel Discussion on Augmenting Grassroots Green Innovations: building bridges between human resources in formal and informal sectors” also held in India in July 1997. As is states in one of the GIAN publications, such workshops “...help in generating respect for each other’s creativity, generate feed back and some times trigger imagination for generating new solutions” (1999:1). These kinds of initiatives, while also trying to seek protection through counter-IP or *sui generis* IP mechanisms, are extremely different from the Registry activities of the Knowledge Cartel.

Endeavours such as the Knowledge Cartel in Ecuador clearly seek to inhibit knowledge and information flows. The centralized and private databases are explicitly designed for a hierarchical and limited access. Implicit to the notion of a trade secret, is that knowledge

holders (which in some cases could be the majority of the indigenous communities and possibly mestizo peoples in the Amazon basin, or outside the basin, with regards to widely held knowledge), would not disclose the information unless an agreed upon decision for disclosure was made. Once disclosed, the outside party would also come under the obligation of nondisclosure. While such a process appears to underline the IP element as an important factor, the Cartel, although perhaps not as explicitly as the Indian initiatives, shares some of the non-IP objectives with that of the CBRs and Registry of Invention.

5.6 *Non-Intellectual Property Right Elements*

5.6.1 *In Support of Slow Sciences*

As Gadgil argues, with regards to the PBRs in India, that folk ecological knowledge and wisdom are rapidly being eroded due to 1) the increasing access of I&L peoples to modern medicines for example, which results in less dependence on local medicinal plants and animals and 2) the increasing loss of control of I&L peoples over their resource base due to take-overs driven by state and corporate interests (1998). This erosion has also led to the destruction of various resources such as the sacred groves in India. Gadgil points to the registry as a mechanism for supporting what he refers to as 'slow science'⁸ through the creation of formal institutions for their maintenance and by creating new contexts for their continued practice. It is in fact the 'fast sciences', rationalized by its codified prescriptions, rules and regulations that Gadgil argues has led to the depletion of resources and subsequent declines in related knowledge. Societies that have developed the 'slow sciences' in fact may hold the key to such environmental concerns. As Gadgil states: "...complex ecological systems highly variable in their behaviour in space and time can be most wisely managed on the basis of adaptive practices which continually adjust the forms

⁸ Gadgil argues that what is commonly referred to as traditional or folk knowledge is more correctly thought of within the category of slow science which better captures the slowly changing nature of practical ecological knowledge. It is the codification of fast science (such as allopathic medicine in both Eastern and Western societies) that facilitates the speed at which it evolves, however, as Gadgil points out, the speed of knowledge codification does not necessarily imply wisdom.

of human interventions on the basis of ongoing observations of their ecological consequences at the local scale” (1998). Perhaps ironically, Gadgil points to the codification of slow sciences in the Registry as a way in which it can develop a strong information base that is not fuzzily defined, poorly organized and fragmented. Gadgil argues, as the Chapter’s introductory quote implies, that such codification is in fact not a surrender to ‘fast’ sciences, but a means to give ‘slow’ science its rightful acknowledgement.

Gadgil is not alone with his assertions that by raising the status of I&LK, various environmental concerns will be met. Vandana Shiva who is also actively involved in the Registry process had formerly raised concerns with what she refers to as partisan science.⁹ Shiva calls for a shift from a science that is guided by vested interests to a public interest science that provides an ecological alternative to the reductionist science and technology of partisan science. Ecology, Shiva argues will provide an epistemological framework for a materialist alternative. Unlike Gadgil however, Shiva does not refrain from providing a history of violence in India due to the imposition of resource intensive industrial activity that has arisen from this partisan science. Major development projects like large dams, forest exploitation, mining and energy-intensive agriculture have led to the emergence of ecology movements in India and elsewhere. Shiva proposes a theory of political development based on the knowledge of the ‘survival economies’ that through their social mobilization, are making visible many of the invisible externalities. These movements are in effect pressuring for the economic internalization of these externalities into the economic evaluation of what she refers to as an elite-oriented development process (Shiva, 1997).

5.6.2 Internalizing Biological Externalities

⁹ Partisan science is reductionist Shiva argues, in that it reduces nature to a non-interacting and isolated collection of individual resources and assumes that natural resources acquire economic value only when commercially exploited.

This notion of an elite orientation, also held by other registry advocates, is resulting in the unequal distribution of benefits arising from recent development activities in the field of biotechnology. Sarkia Bhatia and Ashish Kothari involved in the Community Register initiative of the Foundation for the Revitalization of Local Health Traditions (FRLHT) state that “...significant elements of these (traditional) knowledge systems have, over the years, been appropriated by commercial interests, with little benefits flowing back to local communities” (Dutfield, 1996:9). They argue that the Community Register functions not only to revitalize and protect traditional knowledge (TK) but will allow for the sharing of that knowledge for mutual benefits while protecting communities from commercial users such as bioprospectors. From a neo-classical economic perspective, Dr. Vogel, in support of the Knowledge Cartel in Ecuador, argues that the Registry is essential for internalizing the value of biological externalities for bioprospecting. This internalization at a regional level (unlike the Inbio/Merck agreement in Costa Rica) will support conservation measures and allow I&L communities to mitigate access to knowledge over biological diversity as trade secrets in material transfer agreements. Likewise Utkarsh states with regards to the PBRs in India: “Few examples would illustrate current skewed distribution of information and benefits. The ongoing ethnobiological studies bring handsome rewards only to the researcher by unilaterally exposing the knowledge and resources of the villagers for wider commercial exploitation” (Utkarsh, 1999:1). The Registry whether it functions to restrict commercialization (as in the case of a single national registry like the Knowledge Cartel in Ecuador) or promote it (as in the case of the decentralized public databases and networks of the PBR and Registry of Invention Initiatives of India), ultimately seeks to assert I&L community control over their knowledge and biological resources.

5.7 *Collective Intellectual Property Rights*

Indeed what sets these Registration activities apart from other conservation and community management projects, is that the Registry is also being done as an assertion of or inhibiting mechanism for IPRs. Such rights would allow I&L communities to decide if they wish to enter into subsequent contract agreements. As Dr. K.P. Achar, the Principle Investigator of a PBR Project in India, states in his project report that: "People's Biodiversity Registers (PBR) are records of folk knowledge and practices of conservation and uses - sustainable or otherwise - of local living resources. These are envisaged as an instrument of recording public domain knowledge for the purpose of benefit sharing as envisioned in the CBD" (Achar, 1997). In the case of the Cartel they are also thought to provide the I&L communities with the right to nondisclosure. Hence it is clear from this various initiatives, that although widely different in the means by which the undertake their activities, (decentralized vs. centralized and public vs. private), these processes all seek to assert I&L community rights over I&L knowledge through either non-intellectual property right and intellectual property right mechanisms. A process that seems to be gaining a fair amount of popularity.

5.8 The Growing Popularity of the Registry

A report published in June 1997 by Dr. K.P. Achar at Sri Bhuvanendra College outlines and reflects upon the experience of a People's Biodiversity Register (PBR) conducted at Mala Village, Panchayat in Karnataka State in India, and refers to roughly 10 other like activities taking place in at least 7 different states in India. The AMRUTH publication put out by the FRLHT, referred to above, points to the initiation of 24 Registries in 10 different states in 1995. A second workshop in follow up to the Srustigyan Worksop held in 1994 which led to 10 more initiatives run by the Western Ghats Biodiversity Network and the more recent initiation of 50 more Registries, in 7 different states by the Centre for Ecological Sciences and supported by the World-wide Fund for Nature-India. Such activities, the report states are ongoing (1996:3).

Clearly the Registry has become increasingly prevalent within the Indian context. Likewise, the existing literature on the Knowledge Cartel in Ecuador points to the initiation of the data collection in 1997, in Ecuador, with the aim of progressing at a regional level throughout South America. It also appears that at least in the Indian context, the Register may have even gained greater authority. The above report by Achar refers to the elevation of the Register to the Grama Panchayat Office (Regional Office), where it is available for public use and reference. Although, none of these developments in and of themselves provide an assessment of the Registry in its non-IP capacity, they clearly indicate the emergence of some form of an ecological movement or movements at least within the Indian context. People are clearly documenting their knowledge as a protection mechanism. However, it remains unclear, as mentioned above, as to how such protection will be achieved, particularly with regards to the enforcement of existing IP mechanisms and the implementation of *sui generis* IP protection.

Given that existing legislation in most countries does not provide protection for *sui generis* IPRs, the question arises as to how, it at all, the Registry will be able to provide I&LK protection from interested third parties. Those involved in Registry activities, such as the PBR/CBR in India clearly acknowledge that the Registry may actually function to jeopardize the very knowledge it seeks to protect. For example G. Utkarsh states that: "Critiques of documentation feel that documentation would only boost biopiracy and over-exploitation of resources like medicinal plants, given the information on specific applications of locality contained in the Registers. This fear cannot be ruled out unless national legislation are enacted to protect peoples rights over this information and provide a mechanism for sharing benefits with them" (1999:8). Likewise the Srustigyan Manual outlines 'apprehensions' with regards to the "...availability of easily accessible databases (which) might promote over-harvest and subsequent depletion of these resources" (1994:2). Other concerns raised by Graham Dutfield for example,

point to various technical factors such as the importance of creating incentives to register knowledge and concerns for local level jurisdiction to enable the carrying out of activities related to the Registry and accountability to even the poorest of people and or groups. Finally, Dutfield argues that with regards to the PBR/CBR initiatives in India, the administration of numerous claims for defensive publication would not only mire the already congested legal system, but would be questionable in terms of the establishment of prior art. Given the increasing prevalence of Registry activities, such concerns clearly indicate the need to take a closer look at what exactly is occurring.

Chapter 6

The Ecuadorian Case Study

In an attempt to contextualize the Registry, I undertook a 6 week research trip to Ecuador, that sought to further explore the Registry as a mechanism for the protection of the ‘intellectual property rights’¹ of indigenous and local communities. Although the research problem in and of itself could largely be reflected upon without physically journeying anywhere, it was felt that given the lack of research done in this area, more could be learned about Registries from communities actually engaged in the process. Why were they registering their knowledge? How were they doing it? Who was involved in the registration process and how would the Registry function to ‘protect’ their knowledge?

6.1 *The Case of the Yana Yacu Sacha Project*

For this research I sought to conduct a case study on The Project for the Recuperation and Development of Indigenous Knowledge for the Conservation of Ecosystems and Biodiversity in the Amazon Forest of Yana Yacu Sacha. The project, funded by the UNDP and supported by the Indigenous Knowledge Programme at the International Development Research Centre (IDRC) is co-ordinated by the Quichua Biotechnology Institute ‘Sacha Supai’ (IQBSS) and involves the community of Yana Yacu in the Ecuadorian Province of Pastaza. The project seeks to “...contribute to the recuperation and development of knowledge and technologies of indigenous and ancestral wisdom, strengthening the cultural values and collective rights of the indigenous society of the amazon” (Project Summary). The focus in the Yana Yacu community is on the recuperation and development of forest, food and medicinal crops through a process of documentation and collection leading to an Ethnobotanical Garden. This garden, it is proposed by the project, will contribute to strengthening the collective IPR of the community. As is stated

¹ With regards to I&LK, the term intellectual property right was often used in the Ecuadorian context to describe the right bestowed on the holder of knowledge through legal mechanisms such as patents and trademarks etc., but also included the notion of the ‘natural right’ of the I&L peoples to what they saw as their ‘right’ to the intangible components of their cultural heritage.

in the project summary: "...the strategic role of the Ethnobotanical garden since its implementation will allow for the organized control and management of indigenous knowledge on biodiversity and amazonian ecosystems in order to strengthen collective intellectual property rights of indigenous peoples".² Although the project summary outlines a methodology for the implementation of the garden it does not propose how the IPR of the community would then be protected. This case study directly sought to address the question of how the Registration of knowledge will strengthen the IPR of indigenous peoples.

Although the IQBSS Project Report indicated their involvement in Registry activities, it was found that while they were interested in protecting their 'IPRs', they were not in actual fact, documenting knowledge as a mechanism by which they could achieve this end. As a result of these initial findings, a more conceptual discussion was pursued on the protection of indigenous knowledge. Interviews were conducted with members of the IQBSS and other environmental, legal and indigenous organizations in Ecuador, in an attempt to chart out the current perspectives and strategies for the 'protection' of indigenous and local knowledge and to situate the Registry within this setting.

Although an exploratory excursion into the Ecuadorian context attempted to capture an overview of these various organizational and community perspectives on the protection of I&LK and the use of documentation as a particular protection mechanism, it became clear that at least in the Ecuadorian case, a narrow focus on the IPR aspects of knowledge protection, limited my initial understanding of the broader context. Organizations and I&L communities contacted in Ecuador repeatedly demonstrated that IPR, although important, is only one aspect of a continuum of 'rights' issues. It became clear that the IPR lens which was being used to understand the

²The project has so far conducted a participatory workshop with the community and technical persons from IQBSS (Instituto Quichua de Biotecnología 'Sacha Supai') in order to identify components of the ethnobotanical garden. Two components of the garden have since been initiated: 1) The cultivation of demonstration areas of indigenous systems of sustainable management and agro ecology and 2) a demonstrative area for management of sacred and medicinal plants.

concept of Registries was in fact incapable of capturing the myriad of Registration activities that are occurring outside of the IP construct. Finally, the term 'IPR' in and of itself was problematic, as it often invoked, quite different meanings.

6.2 *Developing a Methodology*

Although the existing literature on Registry activities highlighted the prevalence of projects in India, several reports such as the IQBSS project report and articles on the Knowledge Cartel in Ecuador indicated that Registry activities were not limited to the Asian quarter of the world. Furthermore as this research was supported by the International Development Research Centre (IDRC), as a component of a one year Student Internship, while it was not mandatory to research IDRC funded projects, funding and time limitations presented definite barriers to conducting research in India. A final factor, promoting Latin America as a region of study, was my ability to function in the local language, and a working knowledge of the area, having already spent 7 months in Ecuador several years earlier. The indications that Registry activities were being undertaken by the IQBSS 'Yana Yacu Project', were later confirmed through correspondence with the director of the IQBSS. Through consultation with the other members of the IQBSS team, the director approved my request to conduct research with the Yana Yacu community that would contribute to an IDRC report and a Master's thesis.

6.2.1 *The Methodology*

In order to explore why and how the Yana Yacu Community was documenting their knowledge and how this process would protect that knowledge or knowledge systems, I thought the use of gender sensitive Participatory Rapid Appraisal/Participatory Learning and Action (PRA/PLA) techniques would be appropriate. However many questions arose, as to how I would effectively apply PRA/PLA techniques to this particular research project.

In order to prepare for this research I began taking private Spanish lessons twice a week for the 4 months prior to my departure. While I already had a basic command of the language, I felt it was necessary to immerse myself in Spanish with particular regards to the research task at hand. Hence my classes delved into various research scenarios that greatly improved my capacity as a second language researcher. I also developed a cover letter to participants and a consent form that sought to reflect some of the ethical considerations as outlined by various Indigenous communities such as the Inuit Research Guidelines developed by the Inuit Tapirisat of Canada, and the Dene Cultural Institute Guidelines (Copies of these forms have been reproduced in English only, as Annex A and B respectively. Spanish versions are available).

I also had the opportunity to participate in The 5th Participatory Workshop on Participatory Development entitled: *Participatory Development Concepts, Tools and Application in PLA & PRA Methods* that was held from July 19-24, 1999 in Ottawa, Canada. This, along with further research in the area, allowed me to develop the methodology for my research. Some of the questions that I explored in the workshop focused on how I could involve the IQBSS research team in the process. If, as indicated in their Project Report, they were interested in protecting the IPR of the community, how would the project help to meet these ends? Were there other ways in which they sought to achieve this objective, and did they have ideas and or parameters for how I would conduct my research? Similarly, I explored some of the PLA techniques for working with community members in order to understand an abstract topic such as the 'protection' of knowledge.

6.2.2 Participatory Learning and Action/Participatory Rapid/Rural Appraisal

Although PRA as first coined by Robert Chambers in the 1980's refers to "...a family of approaches and methods to enable local people to share, enhance and analyse their knowledge of life and conditions, to plan and to act" (Chambers, R., 1987), was clearly more than I thought to

achieve in a 6 week period, the range of PLA³ tools I was exposed to in this workshop brought me to a conclusion that although PLA/PRA refers to a much larger conceptual approach, many of the tools could be used to enhance my understanding of the documentation activities going on in the Yana Yacu Community. For example, Transect Walks, Community Mapping, Historical Timelines, Venn Diagrams, Seasonal Calendars, Ranking Matrix, Semi-Structured Interviews, Flow Charts and Testimonials were many of the tools I explored and sought to use. I also wanted to take into consideration, the gendered dimensions of issues related to access and control over resources. Finally, I felt it to be important for the research approach, to be strongly guided by the priorities of the IQBSS and the Yana Yacu Community through a somewhat more iterative process of consultation. Their expectations and guidelines would in fact be an extension of my own research as an information 'prospector'.

Semi-structured interviews with the IQBSS staff and community members of various ages and gender groups would be undertaken to explore the particular project in question. Interviews would explore member's expectations and obligations of myself, descriptions of the project, including how and why the project was initiated and how and why the activities would address and protect the IPRs of the Yana Yacu Community. A Transect Walk through the community with community members would involve observation and discussion. The Walk would also provide an overview of major ecological production and social stratified zones of the community. As the Yana Yacu Community gardens were a primary part of the project, various activities in the garden(s), such as Semi-Structured Interview, Daily Schedules, Seasonal Calendars would also allow me to explore who was involved in the selection of species for the gardens, how they were selected and why. Likewise Historical Timelines were thought to be of use for exploring important events in the community and changes in activities and division of

³ PLA or Participatory Learning and Action is considered to be the next generation of PRA, seeking to involve people in a process of exploration analysis and action.

labour. Although many of the PLA/PRA activities listed above, would also help to explore various inter and intra-community territorial assertions, the ethnobotanical documentation would be explored in greater depth as a particular protection mechanism. How, or did they protect knowledge in the past from outsiders or from others within the community, how were they protecting knowledge today and why? Historical Timelines, Seasonal Calendars and Daily Schedules, along with Matrix Ranking would be used to explore the parameters for the decisions in the past and the present as to what and how knowledge and/or knowledge systems would be protected. (Sample questionnaires and related PLA/PRA techniques, are reproduced in English only, in Appendix C and D for staff and community interviews respectively. They are also available in Spanish.)

6.3 *Research Limitations*

Perhaps, not unlike many research endeavours, my research faced many constraints. Besides factors such as a tight budget, a limited time for field work due to other obligations at IDRC, and language constraints (not only would I be functioning in a second language, but many of the people I would interview would also be functioning in a second language, or may not even speak Spanish at all), several more substantive issues arose. Indeed some of these issues were raised by the Carleton University Ethics Committee, and my research proposal was approved, pending clarification of some of these issues. Primarily these concerns addressed the complexity of the informed consent letter, the ability to use PLA techniques in such a short period of time, the necessity of involving indigenous people in my research, and finally concerns for my affiliation with IDRC. I have included a copy of my letter in response to the Committee that helped to clarify some of the issues raised (Appendix E). While these concerns identified interesting and important limitations, I felt that they were in some cases neither insurmountable

nor detrimental to my research. Perhaps most importantly was that I would address these various limitations, and other unforeseen ones, in the analysis of my data.

Other concerns that I felt could also function to limit my work, was the 'research & development' fatigue that I had noticed many I&L peoples had with Northern students and researchers. This concern had presented itself to me on a previous school year student exchange I had participated in, in Ecuador several years before. Many indigenous organizations seemed reluctant to take on 'yet another Northern student' who needed to fulfil academic or other requirements, with little, if any return for the I&L peoples involved. This sentiment also seemed to be reiterated in various articles addressing research with I&L communities and issues surrounding IPR (Gupta, 1999, Kothari, 1997). This limitation I felt had an extra implication, in that it already functioned to bias my perspectives of I&L peoples that may not have such concerns in the first place. It also caused me to experience trepidation and fear of over stepping boundaries, and falling short of community and organizational expectations. Not unrelated to this factor were other possible limitations such as my gender, age, academic affiliation and my 'outsider' status (as non-indigenous and non-Ecuadorian), that could function to inhibit my research. While many of these limitations could also present themselves as strengths, the greatest concern that I had, was with regard to the very nature of my research. I certainly did not want to jeopardize the very intellectual property rights that these I&L peoples sought to protect in the first place. The irony, that I too was a 'prospector' of sorts, was certainly not lost upon me.

6.4 Research Findings

As a result of various technical and substantive issues I did not go through with my proposed research with the IQBSS, Yana Yacu Project community. Through interviews with several staff members of the IQBSS I realized that although the Yana Yacu community had collected and documented several plants, they had not done so with the specific goal of protecting their

intellectual property rights. Although this documentation, along with other activities, was a part of a larger non-IP strategy, of which IP protection was thought to be an important part, it became apparent that the project was not specifically a Registry endeavour. In particular, it seemed that while I was there to learn from the organization and community as to how they imagined this project would protect their IPRs, they thought I was there to tell them how this would be done. This preliminary finding, although disappointing, raised several interesting questions which will be explored in the analysis section of this chapter. Finally, while these initial findings may have been better clarified by visiting the community itself, I was to find out that such a trip would cost me USD 900 return. Although the IQBSS staff expressed their desire for me to visit the community, this additional cost was beyond my budget. As a result, of both of these findings, I embarked on a largely conceptual exploration surrounding a discussion on the protection of indigenous and local knowledge. Through interviews with various environmental, legal and indigenous organizations and peoples, I attempted to chart out various current perspectives and strategies for the protection of I&LK in order to better understand and situate the concept of the Registry.

Although the emerging map this research gives rise to, largely reflects my own interpretation of information, I have attempted as best as possible to create the space for organizational perspectives and categories to be voiced. My research findings will be presented as emerging and sometimes overlapping categories that reflect the perspectives of environmental and indigenous organizations interviewed. Although the questions explored in each interview differed widely, according to the background of the interviewee and their particular organizational context, my findings will be presented around general themes that evolved throughout the interviews. Hence these evolving discussions will be explored through the themes of organizational strategies with regards to IPRs, perspectives of the Registry as one such

mechanism and from the perspective of various legal and policy developments within the Ecuadorian context. A complete table of organizations contacted can be found in Annex F.

6.4.1 Environmental Organizations

A central focus of my research on Registries revolved around the *Knowledge Cartel*. Interviews were conducted with various people involved in the administration of the project at Ecociencia, an environmental NGO, based in Quito, and its legal counterpart SUBIR-CARE. Although the existing literature on the project indicated that the Cartel was at a more advanced stage, interviews revealed that it is in fact still in its more preliminary stages. Interviews explored the objectives of the project in more detail, the development of the GIS database, which is in its final stages of completion, and issues regarding the initiation and undertaking of the project at the community level. The description of the Cartel in Chapter 5, largely reflects a synthesis of information obtained from literature and these interviews, and does not need to be reiterated here, however a closer examination revealed elements of a much larger context surrounding the Cartel.

Ecociencia, while predominantly involved in conservation projects throughout Ecuador, has historically shared knowledge of biological diversity through publications and submissions of samples and documented knowledge to the National Herbarium. As a result of the increases in bioprospecting activities, Ecociencia has initiated a moratorium on the full and complete release of information. Hence while publications and contributions to other research institutes continues, Ecociencia claims that these will continue to be only a partial release, until suitable legislation is passed that protects this knowledge. It was unclear however, if this 'protection' was a reflection of the interests of the nation state, or of indigenous and local knowledge holders. This position is perhaps reflective of the Cartel proposal more generally, as it attempts to halt information flows until agreeable circumstances and terms are met.⁴

⁴ A visit to the National Herbarium in Ecuador did not reveal whether contributions in samples and related information had decreased. Specimens available to the public for research, were accompanied by information limited to the species and class, scientific and common name, location of sample, including the

It also became apparent that the Cartel is perceived by its administrators as part of a continuum of strategies for community capacity building for the organization, creation and management of biological resources. The 6 paralegal booklets published by SUBIR-CARE address not only issues surrounding bioprospecting and loss of biological diversity, but the process by which communities can become an 'organization' in order to seek legal rights to land, natural resources and forested areas, and outlining their rights with regards to oil, mining and tourism activities. Hence a larger rights context emerged from these interviews, of which IPR is only a part.

Although I had been informed that I&L communities had not as of yet become directly involved in the Cartel, interviews and visits to two indigenous communities involved in an Ecociencia, conservation project, entitled Proyecto Paramo,⁵ revealed that while such objectives are being explored within the civil society arena, community members and researchers are largely unaware of issues related to intellectual property rights. The Paramo Project perhaps not unlike the numerous conservation projects in Ecuador, and throughout Latin America works with Indigenous communities to develop sustainable resource use activities. Researchers and community members interviewed, formally and through informal discussion groups had given

GPS and a brief description of the sample. The National Herbarium of Ecuador shares its database with the Missouri Botanical Garden Herbarium and recently published the entire database in 1999. Approximately 600,000 collections have been made in Ecuador to date (Jorgensen, et.al., 1999).

⁵ The Paramo Project, supported by The Mountain Institute, Ecociencia and the University of Amsterdam, has been engaged in a process of participatory 'scientific' research and documentation with various I&L Paramo communities (the Paramo is an ecosystem that exists in the Sierra above 3400 metres and lies between 10° North and South of the equator). In its second phase it will be engaging in community mapping as part of an environmental and community management strategy. Although I did not have more time to pursue this topic, it would appear that community mapping is an important and widespread activity of documentation that seeks non-IPR protection for I&L communities through the assertion of territorial rights. Although in the case of the Paramo Project it seems to be more of a top down approach (although participatory in that communities identify the problems and actively participate in the project), other community mapping endeavours have been sought out and run by the community (such as Richard Reisl's work with the Shuar in the Amazon, and Suzanne Poat's work in the Sierra on the Manrear Project).

little if any thought to issues surrounding IPRs. Although supported by Ecociencia, project employees interviewed, were unaware of the Knowledge Cartel Project, nor knew of the moratorium on full information release, initiated by Ecociencia. Although the community and researchers had largely not thought about issues surrounding IPRs, there was a strong affirmative response from the community (through a presentation of my research and a resulting discussion with approximately 15 Quichua community members living in the Paramo) and from two scientists working on the project, that they would like to know more about IPR, their options and the implications of IPR protection of I&LK. Whereas the community wanted to know how to protect their knowledge, the two researchers wanted to discuss the consequences of inhibiting information flows.

Accion Ecologica, another environmental NGO in Ecuador, seeks collective and environmental rights for I&LK through environmental impact monitoring, workshops and *campañas* working in different areas such as petroleum, mangroves and biodiversity. One *campaña* entitled '*No patentes la Vida*' [No patenting on life] opposes the privatization and the application of IPR on biodiversity and openly denounces projects such as the Human Genome Project. Although AE has put forward a proposal for *sui generis* biodiversity legislation it merely outlines general notions such as the need for collective rights. Although the Cartel was considered by both AE interviewees as an interesting alternative, the contradiction between the counter-IP position of defensive publication, and the IPR nature of the Cartel was not addressed. Likewise, AE has not worked in the areas of elaborating what such 'collective' rights would look like.

Although there are clearly numerous environmental organizations in Ecuador, due to time constraints and other factors such as the inability to obtain interviews with some of the

organizations, my research reflects the perspectives of only a few environmental organizations. However, it is also my impression from interviews and a literature review, that in fact not many organizations deal directly with issues surrounding IPRs. As I was also attempting to chart out I&L perspectives and endeavours, my research turned largely to these kinds of organizations and communities

6.4.2 Indigenous Organizations

Interviews with indigenous organizations such as the IQBSS highlighted the interest of organizational members to have a better understanding of their IPRs. Such rights, however, were perceived as a part of a larger rights context. The Yana Yacu Project of the IQBSS for example, was engaged in the collection, documentation and use of resources as a means of conserving knowledge and/or biological diversity, however they were also undertaking these activities in order to assert territorial rights over the land and resources they were inhabiting. The three member of the IQBSS interviewed, discussed the history of territorial conflicts in the Amazon basin. Although the Yana Yacu community (covering approximately 100 000 hectares of land on the Eastern Ecuador-Peru boarder), was once inhabited by indigenous peoples, the rubber exploitation in that region pushed natives from that region further west. According to the members interviewed, the region was only repopulated in 1992. It was unclear if the repopulating was specifically an indigenous initiative or a government relocation strategy. However interviewees claimed that while more western reaches of the Pastaza province continue to grapple with incursions through petroleum, mineral, forestry and more recently bioprospecting activities, the community of Yana Yacu is largely free of these pressures. As one interviewee stated in response to why people have moved to the Yana Yacu Community: [To create a community different from their own. Management of resources and a vision and enjoyment of moving away to new places. They like to go far from everyone, and be in the jungle] (Interview,

23 September 1999, Quito). While IPRs may be of interest and importance to organizational members, other factors such as health and education, have been at the forefront of community initiatives. As one interviewee states:[...more or less 10 stable families (live in the community) at any given time. People have come and gone for reasons such as health problems. Some come with the entire family, others with only a few. There is also a school on the community now] (Interview, 23 September 1999, Quito).

The COICA (Coordinadora de las Organizaciones Indígenas de la Cuenca Amazonica), which represents indigenous organizations in the Amazonian Corner and indigenous communities from Bolivia, Brasil, Columbia, Ecuador, Guyana Francesa, Guyana, Peru, Surinam and Venezuela and works on the promotion and development of unity amongst organizations and communities, towards territorial rights, self determination and human rights, although not opposed to the Registration of knowledge as a protection mechanism seeks more specifically to defeat patent claims such as the Ayahuasca patent which they consider to be acts of biopiracy, also seeks collective rights over indigenous knowledge. According to COICA, it would appear that although the 'Registration' of I&LK for IP protection is currently not going on in Ecuador, that it may still be an interesting proposal for I&L community consideration. The Registration being referred to in this interview was related to the use of defensive publication and not the formation of a knowledge cartel. However the topic of I&LK protection, it was felt, still needs more study and consideration. The interviewee went on to explain that although a 'Sub Working Group on Traditional Knowledge' existed, that it had not entirely got off the ground. In response to the Knowledge Cartel proposal, the interviewee indicated that various non-indigenous proposals such as the Cartel were not necessarily reflective of indigenous perceptions and needed greater consideration. Finally, the COICA has also recently co-published a book entitled: *Biodiversidad, derechos colectivos y régimen sui generis de propiedad intelectual* (Biodiversity,

collective rights and sui generis regimes for intellectual property), that provides an overview of the issues regarding the protection of I&LK, mechanisms in place for its protection such as international rights and IP regulations and proposes that I&L peoples come up with their own indigenous system of knowledge protection.

Although a further exploration of Amazonian Indigenous activities through a local organization such as OPIP in Puyo, may have provided some useful insight regarding IPRs, various factors such as the volcanic activities in nearby Baños which inhibited my travelling to this region and various articles outlining Registration activities in the Northern province of Imbabura, led to further research with several indigenous organizations in Otavalo and La Esperanza.

An article by Brij Kothari entitled: 'Indigenous rights to the benefits of research: A case study of participatory ethnobotanical research in Imbabura, Ecuador' Pg. 141-157 in *Eds. M. Rios & H.B. Pederson. Uso Y Manejo de Recursos Vegetales*, explores the notion that Kothari refers to as the Rights to the Benefit of Research (RBR) as an important and yet largely unexplored aspect of the rights discourse relating to IPRs. Kothari argues for a shift in the research mentality that is merely 'extractive' and not 'democratic'. Kothari points to the case study of a participatory ethnobotanical research activity in Imbabura Province that as a result of the recent rapid loss of indigenous or campesino knowledge allowed for the documentation of knowledge that Kothari argues went beyond merely extractive conservation tactics (now occurring widely throughout the region). Kothari argues that the project encouraged campesinos (men and women) to participate in the investigating and documenting of their medicinal plants towards fulfilling one of their basic and growing needs for a 'culturally compatible health care alternative' (1997:147). The resulting publication of a bilingual book (Quichua and Spanish) was

also more accessible to campesinos as it was simply laid out and had drawings, icons, scientific and local names. Kothari argues that both compensation and local empowerment were attained (beyond researchers benefits from earning academic degrees etc. he argues that profits from book sales, sharing of knowledge at intra and inter community level, the creation of gardens and the eventual use of this knowledge in schools) all contribute to RBR. The Fundación Sabiduría Indígena, or indigenous knowledge foundation, a grass roots foundation dedicated to the conservation of indigenous peoples knowledge and culture, was to be the second phase of this initiative.

Although I was to find that this initiative was no longer under way, interviews with various members of the Union de Organizaciones y Comunidades de Anyachaya la Esperanza y Caranqui (UNCONIAE-C) and the Federación Indígena Campesina Imbabura in La Esperanza and the Jambi Huasi Centro de Medicina Alternativa and the Centro de Estudios Pluriculturales (CEPCU) in Otavalo identified that members of these organizations and communities find intellectual property rights to be an important part of a larger rights context.

The Union de Organizaciones y Comunidades de Anyachaya la Esperanza y Caranqui (UNCONIAE-C) and the Federación Indígena Campesina Imbabura in La Esperanza, both involved in the initial Fundación Sabiduría Indígena, mentioned by Kothari, voiced that although they weren't continuing to Register their knowledge, it was simply due to a loss of funding. Whether it is territorial rights, the rights to clean water or intellectual property rights, representatives of both organizations emphasized that for indigenous and local peoples it is the simple fact that while they have no means of ensuring that their rights are met, it is more often the case that they do not know what their rights are in the first place.

Likewise the Centro de Estudios Pluriculturales or CEPCU, a private, non-profit indigenous organization in Otavalo, has one project that works specifically on community land use planning as a political non-IP strategy. So far the project has done 17 participatory diagnostics in the region of San Pablo (near Otavalo) whereby community members through individual and group mapping explored the history of the community, the current situation and the vision of the community with regards to economic activities, the environment and natural resources uses. Although this project has not specifically looked at the process of documentation in terms of IPR assertions it became apparent that this was of interest to the organization. They expressed, as the various organizations working on non-IP strategies have, that learning more about how to protect their IPR would be of great interest and use to them. They have also published a book entitled: *Sapi: Sabiduria Comunitaria* (1999) that presents various San Pablo community members visions of their natural resources, customs, myths and legends. It was felt by the director of the organization that the community's IPRs were protected through the copyright protection attained by publishing this book.

Finally perhaps what were the most significant findings of this research trip were the responses of I&L medical practitioners at the Jambi Huasi. The Jambi Huasi Alternative Health Centre in Otavalo is actively promoting an accessible alternative health option to indigenous and non-indigenous communities in the Otavalo region. The Centre provides 'occidental' and 'indigenous' medical options to the indigenous community who they feel have been marginalized by an expensive and discriminatory health system. The Jambi Huasi actively promotes indigenous medical knowledge through its use and seeks to 'elevate' it through an integrated health system. Some of my most fascinating interviews took place with 4 medical practitioners at the Jambi Huasi. They spoke about their work, the centre and their views on the Ecuadorian health system. They also spoke about the importance of keeping their knowledge alive through its

continued use, and that although ‘documenting’ their knowledge may be useful or important for negotiating with pharmaceutical corporations for example, they also expressed that much of their healing is not actually easily documented. Documentation could never capture the full significance of indigenous healing and in fact represents a fragmented way of capturing knowledge. It is through the use of I&LK that it will be ‘protected’.

6.4.3 Intellectual Property Rights as Part of a Larger Strategy

This preliminary inquiry into the Ecuadorian case reveals that intellectual property rights, although not being fully discounted by I&L peoples, are only one aspect of a larger rights discourse. Indeed every interviewee raised the question of the implications of their work for I&L people’s IPRs. Hence, while the Knowledge Cartel Project may be representative of a non-indigenous strategy, this fact does not necessarily imply that it would not be of interest to I&L communities. In an attempt to better understand I&L organizational perspectives on this topic, interviews also explored participant views on the Registry. Depending on the background of the interviewee, in some cases I provided an explanation of the possible parameters for a Registry, in others, the interviewee provided me with their own vision.

With regards to the Registry, COICA , in its recent publication, argues that while defensive publication and the trade secret may provide useful interim strategies for I&LK protection, they may also function to undermine I&L IPRs. In the case of defensive publication COICA states that: *“El sistema descrito podría permitir a los pueblos indígenas impedir que compañías o personas individuales patenten invenciones derivadas del conocimiento y de los recursos indígenas, con la presentación de toda la documentación pertinente y los principios activos debidamente aislados....la publicación defensiva puede ser contraproducente porque podría ayudar a acelerar las investigaciones de terceros”* (1999:47). [Although the system

described (defensive publication), would allow indigenous communities to impede individuals or companies from patenting inventions that have arisen from the knowledge and resources of indigenous peoples through the presentation of the relevant documentation and the appropriate isolated and active sources...defensive publication could prove to be counterproductive and could in fact help to accelerate third party investigations].

6.5 Technical Concerns

6.5.1 Defensive Publication

Indeed, various factors arise that raise concerns regarding the 'effectiveness' of the Registry for defensive publication. As described above, defensive publication refers to the ability to inhibit or defeat a patent through the establishment of *prior art*, or the existence of the same or similar published knowledge. In most countries, a patent search is done to determine if there is any existing publication, if none is found then a patent application is written up. However, if the search misses the publication, the original innovator can then seek to defeat the patent through the demonstration of *prior art*. Tim Roberts, a patent expert involved in the Crucible Project argues that while this is true for most countries, it is uniquely not so in the United States (1994). He goes on to point out that in the US, the development of the Statutory Registration of Inventions, entitles inventors who do not wish to receive monopoly rights, to apply for a patent, with the exemption for the examination for novelty. In this case the material to be published would still have to be considered technically useful and would be fully disclosed in order to be repeated. In the case of living organisms this would result in the deposition of the organism as a sample. This raises some interesting questions with regards to the Registry as an effective mechanism for knowledge protection.

Clearly both kinds of Registries outlined above, that seek defensive publication, are not formally applying for 'statutory' protection. They are merely publishing knowledge (outside of

the patent system) that could be used to subsequently defeat patents they can prove copied or were based on the registered knowledge. Such registration does not require the patent office to search this knowledge. One of the challenges for defensive publication as a positive assertion, is the development of supporting legislation. Another challenge is that much of the knowledge has already been published. In an interview with Ecociencia, it was stated that conceivably 90% of IK has already been published. If some form of legislation was passed, that replicated the US model, mere publication would not be enough, as the 'original' innovator would be able to run an intervention in order to demonstrate his or her prior research.

Hence in order for the Registry to be an effective defensive mechanism, communities or representatives would have to continually contest acts of biopiracy and demonstrate through the Dispute Settlement Body of the WTO or through bilateral dispute channels, that this knowledge was formerly published. In the case of the Ayahuasca patent, COICA, is in fact exploring the possibility of establishing *prior art* in order to defeat the patent. *“Los expertos señalan que la Banisteriopsis Caapi crece en toda la amazonía, y que la planta descrita en la patente concuerda con muestras recogidas anteriormente por otros investigadores”* (1999:12). [Experts indicate that the *Banisteriopsis Caapi* grows everywhere in the Amazon, and that the patent description matches earlier recordings made by other researchers]. Although this notion of Registration could increasingly be extended to include other ways in which knowledge is documented, such as the oral testimony of the Nisgaa' in Western Canada, this manner of establishing one's rights does not directly make a positive assertion. In order for defensive publication to be formalized, legislative amendments would have to be enacted in order to require the extension of searches to CBRs and or Registries of Invention.⁶

6.5.2 Questions Regarding Protectable Subject Matter

⁶ At an administrative level it has been argued by some that such a requirement would place an unmanageable administrative constraint on already overburdened patent offices -(Dutfield, 1997).

Another limitation to this kind of Registry, as in the case of the CBRs, is that there is no clear distinction between general knowledge and protectable subject matter. Everything is being documented irrespective of the particular knowledge deemed by the community as falling within the scope of protection. The US legislative example clearly demonstrates that some kind of parameters for protectable subject matter would have to be developed in order for searches to include the Registry. (Furthermore, as with the patent system, if everything were patentable it would in effect defeat the entire purpose of the system). Secondly in the case of the Registry of Invention and in many of the CBR initiatives there is no evidence of deposition of the sample organism to enable it to be 'repeated'. Hence Registry endeavours would have to carefully consider what they would like to define as protectable subject matter and may also have to consider undertaking community seed bank initiatives in order to fully support the defensive publication mechanism.⁷

6.5.3 The Trade Secret

Many technical concerns also arise with regards to the use of the trade secret. As indicated by COICA, the trade secret or commercial secret "*...podría proteger el conocimiento tradicional con aplicación comercial y cubrir más áreas que los otros mecanismos de propiedad intelectual. Sin embargo, su inconveniente radica en que no ha sido su aplicación práctica en ningún país, hasta ahora*"(COICA, 1999:49). [...could protect commercial traditional knowledge and provide greater protection than other intellectual property mechanisms. However, its greatest barrier is that there has to date been no practical application of the trade secret anywhere in the world]. In the Knowledge Cartel example, it is clear that all kinds of knowledge would be documented, that is not necessarily of commercial value. Although

⁷ While defensive publication may be useful for large seed banks such as held by the IARCs, it may not be applied so easily to Registries given that in most cases they do not necessarily have the funds to start up or maintain a seed bank. In situ conservation practices may have to be included in the definition of a living seed bank.

possible, this would certainly stretch the scope of the trade secret to its limit. This may be feasible, but as of yet it is not clear that this new or extended application of an IPR mechanism will work. Such concerns raise interesting questions with regards to the Registration of knowledge in particular, and the widespread documentation initiatives more generally. Whether communities are documenting their knowledge for IP or non-IP protection, both could inadvertently function to undermine I&L peoples IPRs.

Other assumptions inherent to this model are that confidentiality will be kept. If knowledge is held by several individuals within or throughout various communities it would be extremely difficult to ensure confidentiality. Furthermore, it would be difficult to ascertain who divulged the information, in the case that confidentiality was breached. Another weakness in the model is that given the large amount of species already documented in ethnobotanical journals, catalogues and national herbariums it would inhibit secrecy due to the prior disclosure of the information. Following upon this point, is while I&L communities may maintain confidentiality, the biological diversity on their lands is still easily accessed by bioprospectors. It has also been pointed out that knowledge held in common by a community or communities may not even hold as a trade secret and that it may conflict with the TRIPs Agreement (Simpson, 1998).

6.6 *Assumptions and Administrative Factors*

Finally there are several underlying assumptions with both models that beg further examination. For one, there is an inherent assumption in these various Registry endeavours, that all communities/peoples will want or will be able to document their knowledge. While a massive awareness campaign would have to be initiated so that communities did not get excluded from registration this still may not account for those uninterested in participating. Secondly, given that protectable subject matter would have to be defined, it is highly possible that what I&L

communities define as protectable, would be of little interest to the private sector, leaving the unregistered material open for appropriation. Furthermore it would be very difficult for communities to predict this. Finally, what has actually been documented may not necessarily prevent the patenting of 'valid' inventions based on registered knowledge that 'isolated' or 'discovered' a new gene or through the use of registered materials that enabled the production of varieties with significantly improved properties. Hence the Registry may in effect facilitate further acts of misappropriation, the very thing many of its participants are seeking to control.

While Ecociencia argues that the notion of a regional trade-secret in fact reflects I&L historical methods of knowledge protection, it became clear from the interviews conducted, that the use of IPR as a protection mechanism for I&LK was only one possibility for further consideration. I&L communities contacted, expressed an interest in learning more about 'their intellectual property rights' as one aspect of a larger rights 'struggle' in general. However as pointed out by the practitioners of Jambi Huasi, such a system should clearly not impede the larger goals of non-IP protection for I&LK. Furthermore, as suggested by the COICA, although existing IPR mechanisms may prove to be useful for the protection of I&LK, I&L peoples need to develop a system that will best reflect their needs and values. It was indicated by most interviewees, that such a system, be it achieved through the Registry, or through other mechanisms, would still require the necessary legislative changes for its support.

6.7 *Legal and Policy Developments*

Legal and policy developments at the national, regional and international levels are influential factors to a discussion on the protection of indigenous and local knowledge. My research in Ecuador also sought to explore various perspectives on legal and policy developments in the areas of intellectual property rights, conservation and the protection of indigenous and

local knowledge and the applicability of the Registry in particular. Interviews with organizations such as Accion Ecologica, Ecociencia, Subir-CARE, a legal-environmental organization entitled the Centro Ecuatoriano de Derecho Ambiental (CEDA) and the Ministerio de Agricultura y Ganaderia, along with research in various Ecuadorian universities, bookstores, legal institutes and publishing houses, brought to light some of the important and also contentious policy developments regarding the protection of indigenous and local knowledge with regards to biological diversity.

Several organizations and institutes such as the CEDA and the Ministerio de Agricultura y Ganaderia underlined the importance of the Constitution, IPR law and Ecuador's Biodiversity Law as largely reflecting the harmonization of international agreements and obligations submitted to by Ecuador. Likewise, both environmental and indigenous organizations interviewed, pointed to the importance of these developments. However while many of these changes reflect the importance of the protection of indigenous and local knowledge and the conservation of biological diversity, the latter organizational groups went on to argue that they are also fraught with tensions and contradictions, with regards to applicability.

Ecociencia, Subir-CARE and COICA, all pointed to the amendments of the recent August 1999 publication of The Constitución Política de La Republica del Ecuador. Indeed the Subir-CARE Paralegal manuals, draw attention to several Constitutional Articles that highlight the rights of indigenous and local Ecuadorians with regards to biological diversity. Article 18 for example underlines "*Los derechos y garantías determinados en esta Constitución y en los instrumentos internacionales vigentes...*" (1999:4) [The rights and guarantees elaborated in this Constitution and in the following international instruments...], for among things, equality under the law, and as later articulated under Article 86, the right to live in a clean environment and

sustainable development that is, ecologically stable and free of contamination. Section 1 of Article 86 in particular states that *“La preservación del medio ambiente, la conservación de los ecosistemas, la biodiversidad y la integridad del patrimonio genético del país”* (1999:22). [The preservation of the natural environment, the conservation of ecosystems, biodiversity and the integrity of national patrimony over genetic resources]. In the spirit of Articles 8j and 10c of the CBD, Section V of the Constitution goes on to outline the specific collective rights of indigenous, black and afroecuadorian peoples. Article 83 of this section define these peoples as *“Los pueblos indígenas, que se autodefinen como nacionalidades de raíces ancestrales, y los pueblos negros o afroecuadorianoas, forman parte del Estado ecuatoriano, unico e indivisible”* (1999:20). [The indigenous peoples that self identify themselves with nationalities of ancestral roots, and the black peoples and afroecuadorian that form part of Ecuadorian state, unique and indivisible]. Article 84 goes on to outline the collective rights of these peoples with respect to among other elements, maintaining and developing their cultural identity and traditions, the conserving of their property rights to their communal lands, the conservation of the natural resources of the lands and the involvement in plans and projects for prospecting and exploitation of such resources and the participation in the benefits derived. Section 9 of Article 84 specifically states that collective rights will extend to: *“A la propiedad intelectual colectiva de sus conocimientos ancestrales; a su valoración, uso y desarrollo conforme a la ley”* (1999:21)”; [To collective intellectual property of their ancestral knowledge, its valorization, use and development as conforming to the law]. These changes clearly reflect Ecuador’s involvement in international agreements such as the Convention on Biological Diversity, and imply a greater obligation of the state towards indigenous and local peoples and the conservation of biological diversity, however, as repeatedly indicated in interviews, the Constitution does not clearly identify how such ambitious statements will be met. How for example, will the collective IPRs of indigenous Ecuadorians be ensured?

While Ecociencia and Subir-CARE are clearly arguing for the use of existing IPRs, such as the trade secret as mechanism for I&LK protection, other organizations such as Accion Ecologica and COICA argue that IPRs are not enough. They advocate for the larger goal of 'collective rights, which would not be entirely addressed through the formation of a Knowledge Cartel. While such tensions may never be resolved, the majority of interviewees agreed that access agreements were paramount to any endeavour. However Ecuador's involvement in regional trading agreements such as the Andean Pact Agreement, while largely promoting indigenous and local rights, suffer from deficiencies.

While the CEDA points to the Annex of Decision 391 that outlines contract obligations, that oblige interested third parties to first negotiate with the knowledge holder before submission of the contract to the State (to ensure it is in accord with Decision 391), more critical organizations such as the Subir-CARE, Ecociencia and Accion Ecologica argue that in reality although Decision 391 is intended to support a three party negotiation (the prior informed consent of the nation, the knowledge holder and the interested third party), that in actual fact the knowledge holder's interests are held as secondary to that of the nation state's. Accion Ecologica argues that meanwhile, negotiations such as those made with Shaman Pharmaceuticals are hardly representative of the equitably sharing of benefits. Likewise Kothari outlines the bioprospecting activities of the US National Cancer Institute in Awa Federation as subjecting the Awa to a secondary role with regards to the negotiation of activities. While Ecuadorian IPR law continues to support conventional IPR mechanisms such as trade secrets, which is perhaps useful in the case of the Knowledge Cartel, it has done little to promote *sui generis* IP mechanisms for the protection of informal innovators such as the indigenous and local farmers of Ecuador. In fact, it

is argued by Accion Ecologica that Ecuador's recent signing of UPOV 1991 (now harmonized in the national IPR law), has compromised the rights of informal breeders.

Many of these organizations go on to argue that this increasing trend towards harmonizing the TRIPs on the one hand and conventions such as the CBD on the other, open Ecuador to a greater vulnerability with regards to big trading giants such as the United States. Most of the peoples interviewed highlighted that while Ecuador attempts to implement obligations such as the sharing of benefits with indigenous and local peoples and the conservation of biological diversity and associated knowledge, it must contend with countries such as the United States, have on the one hand avoided signing on to agreements such as the CBD, while on the other they continue to promote bilateral agreements that compromise the position of I&L peoples and the biological diversity that is found within the boundaries of many Southern countries. If countries such as Ecuador are to truly ensure the rights of their I&L people, in the face of opposing international pressures, it is perhaps through the support of decentralized mechanisms, that these ends may be achieved.

A final policy oriented question arises, as to who would be entitled to such rights, and what would constitute protectable subject matter, if in fact some form of collective IPRs were to be achieved as a part of the broader rights context. While certainly an ambiguous topic at the policy level, the notion of what constitutes an indigenous and/or local person or community, as outlined in Chapter 2, let alone the protectable subject matter that could be defined as indigenous and/or local is highly unclear. If we look back at the case of the CBRs in India, it would appear that absolutely everything known and even unknown is being documented. As described above, this includes knowledge of the landscape, resource users, historical land pattern use changes, knowledge of the local biodiversity and even cosmological notions of understanding.

Knowledge is documented from individual interviews and through group discussions. While the Registry of Innovation is perhaps somewhat more clearly defined, it would appear that they are still categorized within the broad grouping of individuals and/or collectivities, that either have received IP protection through existing mechanisms or await the advent of a *sui generis* IP system that would encompass their different kinds of knowing. It is not clear how this Registry distinguishes between these different kinds of informal innovations. Finally, the Knowledge Cartel in Ecuador appears to define documentable knowledge within the parameters of medicinal, non-medicinal and a combination of knowledge thereof. This broad definition would appear to leave the scope for protectable subject matter wide open. Likewise, peoples involved in the Registry projects appear to range from all of the people inhabiting a particular territory such as the Panchayat in the case of the CBRs in India, without any clear distinction between possible existing strata of people such as tribals and non-tribals, to 'self-identifying' indigenous peoples (what is commonly held as 'indigenous' in Ecuador) with regards to the Knowledge Cartel in Ecuador.

While these categories have not as of yet been clearly defined by the various projects, and may be easily contestable, they highlight the important factor that there is no clear definition for what constitutes I&L and knowledge thereof. Hence it would appear that at this stage, the parameters that would frame the Registry as a particular entity are in fact porous with respect to protectable subject matter and eligible knowledge holders. Indeed while Registry activities are clearly documenting knowledge, it still remains unclear as to who is involved, what is being documented, and how this process will ensure the protection of I&LK.

6.8 Ideological Issues

Finally, this field work also revealed that while such technical concerns are worthy of careful consideration, that the Registry suffers from much larger ideological factors. Although the situation in India with the CBRs and the Registry of Invention, may prove to be more representative of grass-roots visions, the Knowledge Cartel in Ecuador, would appear at this stage, to be largely an exogenous proposal. Not only were indigenous and local communities contacted, unaware of the Cartel, but they voiced greater interest in exploring various means and mechanisms by which their knowledge and rights could be protected. Increasingly, the Registry became contextualized within the larger non-IP concerns of the often poor and marginalized peoples of Ecuador.

Even if legislation were passed, and technical barriers as outlined above, were overcome, the questions posed by indigenous and local peoples interviewed, demonstrate a certain disjuncture between Northern conceptions and priorities with regards to developments in the fields of science and law, and the needs and perceptions of I&L peoples in developing countries. At the Jambi Huasi, alternative medical clinic, one practitioner for example, asked how documentation would help to protect the knowledge from disappearing. She went on to ask how documentation would help her, given that she is illiterate. The director of the clinic underlined that indigenous knowledge is a holistic learning process, one that cannot easily be conserved through documentation. *"No es como la medicina occidental, nuestras yachacs y parteras tienen una técnica diferente, no es una cuestión que tú puedes aprender de la noche, la mañana o en dos días, es un proceso de investigación constante"* (interview, 26 October 1999, Otavalo). [It's not like western (or allopathic) medicine, our doctors (shaman and midwives) have a different technique that reflects a continual process of learning, not something you can pass on in a moment]. She goes on to question the ease at which such knowledge could be documented in the first place, *"...la método depende de las características físicas de las*

personas, la metodo de diagnostico que utiliza el tratamiento puede ser diferente, puede tener la misma enfermedad dos personas, pero el tratamiento es diferente" (interview, 16 October 1999). [...the method depends on the physical characteristics of each person, while two people could have the same illness, the method of diagnosis and the treatment used could be quite different]. Finally, when asked if the plants are maintained through gardening, another yachac (shaman) pointed out that the knowledge is often held within the plant itself, and the 'sacred' place in which it grows. He went on to say that collecting, gardening and documenting have nothing to do with his knowledge. This is very similar to the thoughts of the Peruvian Amazon healer, Pablo César Amaringo when he states that: "Knowledge - particular medicinal knowledge - comes from the plants themselves, the senior shaman only mediating the transmission of information, protecting the novice from the attack of sorcerers or evil spirits, and indicating to him or her the proper conditions under which this transmission is possible (Lune, & Amaringo, 1993:12).

In a one and a half hour testimony, another medical practitioner who has worked as an indigenous doctor for 27 years, described the history of persecution that the indigenous peoples have undergone, [...I lived and learned from my aunts, and at this time there was no occidental medicine, but oppression kept us from using our knowledge, they said we were witches, they persecuted us, jailed us, they tried to make us forget], (interview, 26 October 1999). Indeed the philosophy behind the Jambi Huasi, underlines the need to integrate indigenous ways of knowing into the Ecuadorian health system itself, and to protect this knowledge through its continued use. [We want to show the authorities that yes, we are an important part of health, although occidental medicine is important, ours is to. Our knowledge is important to other places, spiritual powers, energy, sun and lunar contact, energies of the vegetalists and waterfalls, we work with all life forms] (interview, October 1999). Although Jambi Huasi, and other alternative, indigenous,

knowledge centres may be creating pressure for their space in the mainstream system, as stated by the director:[...but we live in a world where other cultures are not respected, there is not enough protection, but how do we stop it (pharmaceutical searches), we need to stop it, until we know how to deal with it...in some plants, the power is not only a chemical aspect, but they have a spiritual power that is related to the collection of it. Therefore it depends on how you collect it. How will this documentation protect these powers?] (interview October 1999).

In light of the notion of alternative systems, as envisioned by the Jambi Huasi, the entire discussion on Registries appears to be somewhat contradictory. One of the interviewees was quick to highlight that the reason for the creation of the Centre in the first place, was due to a discriminatory health system, that due to costs and difficulties with regards to access, marginalized groups such as the indigenous were excluded. The interviewee felt that, given the lack of legislative support, and the disregard for indigenous peoples in Ecuador more generally, not only would the documentation of knowledge help big pharmaceutical companies, but it would further augment I&L exclusion to the increasing costs of resulting products. As she states: [...(we need) to develop leaders within the communities, and to search for a more integrated approach. Communities need water and light, we need to search for a more holistic approach that reflects the cosmovision of the communities], (interview, October 1999). These sentiments were supported in an interview with Accion Ecologica, whereby it was pointed out, that the majority of the research done by Northern biotechnology corporations, does little to reflect the health and dietary needs of poor indigenous and local Southerners (Interview, 11 October 1999). If health systems, for example, are to reflect indigenous and local visions, as promoted by Jambi Huasi, shouldn't funds and research be allocated to these systems, rather than to a system by which allopathic medical and Northern agricultural models can be furthered? As two practitioners pointed out, a diagnostic and healing treatment using guinea pigs '*diagnostico y limpia de cuy*' is

a central part of the Centre's indigenous medical services. While it is found to be an effective treatment, it is extremely difficult to get funding to further research why and how it works. As one interviewee stated, [...the overall perception is that the cleaning with the cuy functions at a psychological level, we think it is more, not just psychological, we need to research the impacts...] (interview, October 1999).

This discussion on the protection of indigenous and local knowledge, somehow unavoidably, contributes to the construction of a dichotomy between what is and isn't indigenous and local knowledge. While much of the literature, and the majority of legislative draft proposals on I&LK protection tend to avoid fully defining the term, the notion of collective rights has arisen, at least as one key defining factor. This emphasis was certainly replicated in the Ecuadorian context, with most of the organizations contacted, particularly indigenous ones, identifying collective rights as central to the indigenous 'fight'. However, while collective rights seem to proliferate in much of the Ecuadorian legislation, there is often little, if any indications on how such collective rights will be implemented. This is particularly true with respect to collective intellectual property rights. The Registry, be it through a defensive publication, or trade secret mechanism, presents an, albeit problematic option, for the protection of collective rights over knowledge. However one might question the assumption that all indigenous and local knowledge is collective in the first place. While the Registry of Invention in India stresses the importance of both individual and collective IPRs, the CBR and Cartel initiatives promote the protection of collectively held knowledge. Certainly, knowledge held by an individual can be protected as a trade secret, however the very nature of defensive publication precludes indigenous and local peoples themselves, from seeking an individual IPR. As mentioned above, recent discussions on the use of IPRs, at WIPO and in various government and civil society fora, bring

attention to the fact that strict definitions of what constitutes indigenous and local knowledge, many in fact contribute to a static representation of what is a growing and dynamic entity.⁸ Initiatives such as the Registry, if not explored carefully by indigenous and local communities, could indirectly function to limit the possible scope of rights that exist to them as individuals, not to mention inhibit knowledge and information flows, as in the case of the Cartel, stifling the sharing of information for continued innovation.

6.9 Methodological Findings

As if to reflect my research findings, it became clear that although the use of a PRA/PLA research approach may be useful in certain settings, in this case, the methodology developed, was not directly useful or appropriate. Certainly time seems to be an important factor for the appropriate use of such techniques. However, the context of research, in this case predominantly the organizational setting, influenced the tools and techniques that were used. While interviews conducted, were often informal, and in some cases developed into testimonial stories, other PRA/PLA techniques prepared, never seemed appropriate. In fact I found these kinds of tools to be directive and contrived, and soon stopped asking interviewees to draw, or map out their ideas. I continually asked myself why PRA/PLA seemed more appropriate in a community setting and not easily transposed to an office or board room interview, even if that office happened to be in the middle of the countryside. On the other hand, perhaps the PRA/PLA approach assumes that the rural setting lends itself better to the approach, or that people in rural communities have more time to kill.

⁸ At the Inter-American Workshop on Intellectual Property Rights as Applied to Indigenous Women's Art Designs, held in Ottawa, Canada in April 1999, participants identified that traditional knowledge, which although transmitted through cultural heritage, was both dynamic and inclusive of some contemporary innovations, it was also stressed that while TK arose out of the collective innovation of a basic technique or design belonging to a community, the specific refinement or variation based on TK would in fact belong to a particular artist.

One observation, was that for PLA/PRA to be appropriate, the people involved need to be the ones coming to the activity. As an outsider, arriving with my own predetermined concerns and questions and agenda, I soon realized that I was the one who used the PLA/PRA tools for my own analysis. The matrices and Venn diagrams, maps and timelines that I drew became useful tools for me, as I slowly became 'consientized' to the perspectives of indigenous and local peoples interviewed. However the tools, I realized, were reflective of my own categories of thought and not that of the interviewees. It is my conviction, that in order to truly understand different categories of thought, one would have to live for many years in a culture. Certainly while interviews helped capture a dimension of the perspectives of a person or organization, they provided only a superficial understanding of a multi dimensional history.

Language and the rules of social interaction were other limitations that greatly influenced my research. Although they also presented themselves as positive factors, in that nothing could be assumed, often a single topic or word was explored in great detail if there was any concern for misunderstanding, I generally felt concerned that subtleties either were lost in transmission, or explained away through detailed explanations. The use of a tape recorder did little to help with clarifications, as one needed to clarify on the spot in order to continue with a discussion. When I did use the tape recorder it tended to formalize the interview. While in such cases, thoughts generally seemed to be more carefully censored, I also felt that ideas were often better formulated and 'accurate'. In one instance, the interview (with an illiterate woman) included listening to the entire tape recording. It was the first time that the interviewee had ever had her thoughts recorded. She kept asking if that was really her voice. If time permitted, the tape recorder could be an interesting tool for exploring ideas more thoroughly.

Due to the abstract nature of the concept of intellectual property rights, I found the terminology to be alienating and often confusing. In the organizational context I felt that some interviewees felt inclined to speak beyond their range of knowledge on the topic. In other settings, I found myself having to explain what everything meant. This seemed to be quite ironic, given that I was in Ecuador to better understand what they thought it meant. Interviews often became a medium for a mutual exploration on issues surrounding intellectual property rights, bioprospecting, and free trade agreements. Often what I thought to be a factual or obvious question, sometimes demonstrated that I may have overstepped the boundaries. Certainly notions of what should be or is transparent in Canada, are quite different in Ecuador. Finally, it was often simply logistically difficult to get an interview. Telephone messages were generally not replied to, and the notion of an appointment was more casually perceived. Often interviews occurred on the first visit to an organization, and were generally impossible to follow up on. The majority of interviewees were not interested in who I was or where I was from, but would easily launch into a 1 to 2 hour discussion.

In an attempt to contextualize the Registry, this 6 week field trip to Ecuador explored some interesting and unexpected findings regarding the protection of I&LK more generally, and emerging issues surrounding the broader context of I&L peoples rights. Although the initial Yana Yacu community project did not prove to fit within the scope of my research on the Registry, it in fact prompted me to question the very boundaries of my research. The resulting interviews with indigenous and environmental organizations continued to identify questions and concerns regarding various issues surrounding the protection of I&LK more generally and within the Ecuadorian context in particular. Throughout the interview process I began to re-examine some of the predetermined boundaries of my research that functioned to narrow my

understanding of the subject. The framework by which I had developed the working definition for the Registry, the methodology I had developed for researching it, and the language I used to explore it, were all thrown into question as the larger picture of a rights discourse emerged. It was found, that while the Registry may be a useful mechanism for knowledge protection, many factors surrounding the legal instruments of defensive publication, the assertion of a trade secret and the lack of supporting legislation, may in fact function to undermine many of the IP objectives of the Registry. Furthermore, and perhaps more importantly, it was found that as a non-IP mechanism, the Registry does little to move beyond a reductionist model of conservation that in many ways does not reflect the needs, priorities and visions of indigenous and local peoples. It is these findings, that will be reflected upon with respect to the larger context of my research in the conclusion.

Chapter 7

Conclusion

History far transcends any narrow limitations that are claimed for either the power of genes or the power of the environment to circumscribe us. Like the House of Lords that destroyed its own power to limit the political development of Britain in the successive Reform Acts to which it assented, so the genes, in making possible the development of human consciousness, have surrendered their power both to determine the individual and its environment. They have been replaced by an entirely new level of causation, that of social interaction with its own laws and its own nature that can be understood and explored only through that unique form of experience, social action (Lewontin, 1991).

The words of the prominent scientist and geneticist, R.C. Lewontin from his 1990 Massey Lecture's provide an essential point of departure for this conclusion. Central to Lewontin's lectures is that science as a social institution continues to reflect, reinforce and dominate the values and views of society. It is that by placing science on a pedestal as some kind of objective body of knowledge that other ways of knowing are transcended. Lewontin points to two features that have allowed for science to explain and legitimize the world around us. The first rests on the notion of science as descendent from a supra-human source not of the political, economic or social forces. This institution furthermore pertains to the validity and a transcendent truth that is somehow absolute. Secondly Lewontin explains, the institution must have a mystical quality, the unclear inner workings are in effect shrouded by its esoteric language (Lewontin, 1991).

Upon opening any biotechnology journal one is clearly struck by the unending codes and hieroglyphics of this highly advanced language. However, what is apparent from the above discussion is that while such esoteric codes are not being communicated to the public, it is not for a lack of communication. A recent presentation by Dr. David Pramer to fellow scientists at the Eight International Conference on Global Impacts of Applied Microbiology spoke directly to the issue of the shrouded sciences and the resulting misguided concerns regarding biotechnology. He proposed at this conference that, "It is up to us, the biotechnology community, to help reverse the decline in public scientific literacy by explaining the science basic to our enterprise and its many

applications” (Primer, 1990:34). Although the ‘public’ may be suffering from some forms of scientific illiteracy, it would appear that the public is in fact learning. Perhaps the increasing trends towards the commercialization of the life sciences (as mention omitted by Dr. Primer), has had some influencing effects on just what is being communicated. In fact I would posit, it is a necessarily simple language of communication that continues to emphasize the power and truth of reductionist science that can ‘control’ the basic unit of life. Perhaps what is causing the misguided public to be somewhat disturbed, is that the absolute truths of science do not appear to be so absolute. In fact the public is beginning to be concerned with the contemporary chimeras of modern scientific developments.

If we pause for a moment to contemplate the extent of the initial ruling, granting the first ‘life’ patent, it becomes clear that the decision held a wide range of possible implications. In deed in 1971 Anand Mohan Chakravarty was the first to be granted a patent on ‘his’ genetically engineered *pseudomonas* bacteria that was to set the precedent for all subsequent patents of its sort. The national and international implications as explored above, rest upon the conferring of ‘rights’ to the ‘inventor’ for the control and ownership of ‘life’. However as Vandana Shiva points out, ‘Chakravarty was granted his patents on the grounds that the micro-organism was not a product of nature, but his invention and, therefore, patentable” (Shiva, 1997:19). As Andrew Kimbrell, a leading US lawyer and author of *The Human Body Shop* states: “In coming to its precedent-shattering decision, the court seemed unaware that the inventor himself had characterized his ‘creation’ of the microbe as simply ‘shifting’ genes, not “creating life” (Kimbrell, 1993). What is being implied here is that if the inventor did not ‘create’ life and merely ‘altered’ it, it would appear that given the nature of granting a patent (as the full disclosure of a novel (as in new), useful and inventive or non-obvious idea as embodied in products or processes) the inventor in the first instance merely made a discovery.

If we take the analysis of the shuffling of DNA a step further we find that as Freeman J. Dyson states: "One of the most interesting developments in modern genetics is the discovery of 'Junk DNA,' a substantial component of our cellular inheritance which appears to have no biological function... The prevalence of Junk DNA is a striking example of the sloppiness which life has always embodied in one form or another" (Dyson,). Often the inventor, as in the Chakravarty case, has shifted, what scientists call 'junk' DNA, which through trial and error may successfully become a patentable invention (Pollan, 1998; Shiva, 1997). It becomes clear that not only does the granting of patents on life forms completely disregard the complexity of nature, it does so in most cases even when nature cannot as of yet be explained or is explained away as 'junk'. In many cases the full disclosure of the 'invention' often constitutes a deposit of organic material in a public repository. Even the strongest proponent of IPR's might begin to question the 'fullness' of disclosure and the applicability of rights to life in these cases. From the Lewontin perspective, it is at this point that science begins to lose its validity as an absolute. In effect it is no longer perceived as providing meaning for the world in which we live. However, Lewontin also demonstrates in his lectures, that science in reflecting its society, must be understood in terms of an historical process.

As Vandana Shiva argues, recent innovations in the field of biotechnology and their subsequent patents are in fact a part of a colonization project characterized by the 'discovery and conquest' of 'vacant' lands. This process continues as non-western systems are subsumed by reductionist science and technology. For Shiva, "The genetic codes of plants, animals and women's bodies are the uncharted lands, occupied by transnational corporations" (Shiva, 1997). Today, it is the Northern and Transnational Corporations that seek intellectual property rights on the 'vacant' life forms and species manipulated by new biotechnology. The freedom that TNC's claim through IPR protection and its internationalization through the WTO are in fact extensions of the claims made by European colonizers since 1492. The conquest and discovery, Shiva

argues, of new lands and peoples marked the beginning of a colonial process that extended the enclosure of colonial property rights and allowed for the extraction of 'wealth' and knowledge that was perpetuated in the name of capital accumulation. This historical continuum is realized through the 'discovery' of modern biotechnology innovations that are patented as 'inventions' and the 'discovery' of human genes through projects like the Human Genome Project.

However, I would argue that the 'control' the life industries continue to project as they map these microbial imaginaries, is not bounded by a solid border as the 'enclosure' analogy may imply. Although the biotechnology industry continues to project a vision whereby the meaning for life around us may continue to be understood through the scientific lens, the borders are not fully enclosed. The image of the 'control' they command over 'life' is projected into the peripheries as providing for the 'security' and happiness here on earth. Furthermore, the public concerns are a result of our ignorance or due to misinformed media. Clearly the 'operating systems' (a term corporations have coined), of these new technologies, as the term implies, provides the 'security' for the globe through the 'control' they command over these new machines. However, as Richard Lewontin states regarding the 'software' metaphor: "From an intellectual-property standpoint, it's exactly right. But it's a bad one (term) in terms of biology. It implies you feed a program into a machine and get predictable results. But the genome is very noisy. If my computer made as many mistakes as an organism does (in its interpretation of DNA) I'd throw it out" (Lewontin, 1991).

Many of the concerns raised in this chapter regarding the promiscuity and possibilities for genetic transfers leading to 'super weeds' and 'mega bugs' clearly alerts the 'misguided' public that these full proof 'operating systems' are not so well controlled. It seems entirely possible that such organic technology could easily evade the projected claims of its creator. Even the 'marker gene' that Monsanto has placed in all of its transgenic organisms in order to

track them, seems preposterous given that through horizontal genetic transfers this 'marker' could appear in most every organism. However, if as David Collingridge states: "The essence of controlling knowledge is not in forecasting its social consequences, but in retaining the ability to change a technology, even when it is fully diffused, so that any unwanted consequences it may prove to have can be eliminated or ameliorated" (Collingridge, 1980), one might wish to ask him if this applies to living technology. Jeremy Rifkin in his recent book *The Biotech Century*, points to the radical transformation of society under the influences of modern biotechnology, genetic engineering and global commerce. Rifkin explores the possibility for the evolution of society into all manner of horrific outcomes (Rifkin, 1998). Although at present it would appear that genes are not controlling behaviour as Rifkin would imply, given the concerns for secondary recombination, the 'operating systems' of new transgenic 'species' brings such alarming views into focus.

The biotechnology metaphor is also reflected in the Registry initiatives of the indigenous and local peoples and communities around the world, who seek to confront the modern day 'enclosure' they are experiencing, through the creation of alternative strategies. Although this thesis has revealed that the Registry faces various technical and ideological concerns, it still represents an important endeavour, that through its contestations, may enable the necessary shifts from a strategic to perhaps a reformulated ontological approach to the creation of spatial categories. As stated by Shapiro in his book *Violent Cartographies*: "Geography is inextricably linked to the architecture of enmity. But rather than an exogenous 'explanatory variable', it is a primary part of the ontology of a collective. Along with various ethnographic imaginaries - the ethnoscapas that are a part of geographic imaginations - it constitutes a fantasy structure implicated in how territorially elaborated, collectivities locate themselves in the world and thus how they practice the meanings of self and Other that provide the conditions of possibility for

regarding others as threats or antagonists” (1997:xi). As such, this study on the ‘protection of indigenous and local knowledge’, has sought to explore ‘the architecture of enmity’ through the obvious questions of who or what is the documented knowledge being protected from, and how are indigenous and local communities practising the construction of ‘self and Other’?

In the context of the Registry, it has been revealed, that those involved in the process, are specifically seeking on the one hand, to ‘protect’ their knowledge from acts of biopiracy through the assertion of intellectual property right protection, and on the other hand, promoting the elevation of their knowledge, to ensure its conservation and continued use. While many conservation and development projects, like the Registry, undertake the latter objective, the Registry is distinguished by its particular emphasis on IPR protection. Through an exploration of various spheres of contention surrounding advances in modern biotechnology and supporting legal mechanisms, the Registry initially appeared to be an indigenous and local alternative. Registration had emerged as a new spatial strategy, by which communities were attempting to communicate their control and ownership over knowledge to the life industries of the North. However, although this may be true in the Indian context, this preliminary research revealed that at least in the Ecuadorian case the Registry does not necessarily reflect an ontological strategy to a construction of space. Interviewees, although critical of the Registry, acknowledged that while it may serve to meet various strategic aims, that generally it did not appear to be reflective of indigenous and local categories of thought or cosmology.

This thesis, in examining the role of the Community Resource Registry, has revealed, that due to various technical and ideological factors, the Registry may not be a substantial mechanism for the protection of I&LK in and of itself. Although the existing literature indicates that the Registry can provide both non-intellectual property right and intellectual property right protection for I&LK, a closer examination through interviews with indigenous and environmental

organizations in Ecuador, brought to light that not only does the Registry suffer from many technical weaknesses as an IP mechanism, but that in the Ecuadorian context it is representative of a largely exogenous project, that does little to reflect the needs and visions of indigenous and local peoples. I would argue, that if appropriate mechanisms for the protection of indigenous and local knowledge are to be considered, indigenous and local peoples themselves must be engaged in the exploration and development of a system that reflects their cultural values and knowledge systems. As this thesis has demonstrated, such a vision, may not categorically refute intellectual property rights as an appropriate mechanism, but IPRs may be only one aspect of a larger vision.

This examination of the Registry, revealed that although the kinds of Registration activities vary widely, as an IP protection mechanism, the Registry clearly suffers from technical and ideological barriers. The use of the Registry for trade secret assertions, as in the case of the Knowledge Cartel certainly faces numerous challenges regarding the number of potential knowledge holders, the ability to maintain confidentiality, the larger concerns for inhibiting flows of information, and the assumption that everyone will either want to or be able to Register knowledge. Similarly the use of defensive publication arising from the examples of the Registry of Invention and Community Biodiversity Registers in India reveal that as a defensive mechanism it may be difficult to establish prior art, given the wide range of possible downstream developments the original knowledge could undergo. Furthermore it was argued that it may be difficult to ensure that all knowledge is documented, or that necessary depositions of the sample are made. Finally, the Registry does not make a positive assertion, as nothing requires it to be a part of searchable subject matter. On the flip side, if legislation were to be passed that required the Registry to be searched, it is apparent that clearly defined parameters for Registration would have to be developed, given that the initiatives explored in this thesis appear to be Registering everything. Related to this, is the concerns for false registration.

Finally, many ideological concerns were raised in the Ecuadorian context, whereby interviewees pointed to Registration as a reductionist activity, that could not easily capture the holistic and contextual elements of their knowledge. If communities were documenting knowledge, as opposed to using it, the necessary links between the knowledge and the use of the knowledge could easily be broken. It was felt by some, that the Registry would do more to contribute to ongoing research in non-indigenous fields of science than it would to support much needed research on the less known indigenous and local knowledge systems. Interviewees underlined that it is through the use of their knowledge that real protection can be achieved. Without this knowledge, and without these resources, there would be nothing to assert an intellectual property right over. Although the use of the trade secret or defensive publication, along with supporting legislation, may either directly or indirectly protect the collective rights of Registered knowledge holders, it is unclear how oral and sacred knowledge, and the development of knowledge systems for social benefits (as opposed to commercial goods) will be promoted and protected.

Finally, one might argue that the very notion of these kinds of codifications, falls within the existing legal and scientific paradigm, that they may have sought to reject. Although the above distinctions highlight the different processes by which the Registry can function to protect knowledge, they also reveal an interesting convergence of the two models. Clearly, while one model seeks to publicize information, and the other to privatize, both systems function with the use of a restricted and hierarchical database. In effect, the line between the two models becomes increasingly difficult to discern, as they both continue to publish a limited amount of information, restricting what they consider to be as confidential subject matter as a mechanism to promote ethnobioprospecting (over bioprospecting) and subsequent negotiations. Both systems promote a kind of oligopoly right over knowledge.

These findings raise interesting questions and challenges for those currently involved in, or contemplating the use of the Registry as an IP and/or non-IP protection mechanism. The Registry may still be what many of its proponents consider as a necessary compromise. As explored in this thesis, although proponents of the Registry point to it as a possible solution for conserving and protecting knowledge from being lost, it is emphasized by many, as a mechanism for reversing the skewed distribution of information and benefits that have resulted from an increasingly lopsided control of knowledge (Achar, 1997; Gupta, 1999; Kothari, 1994; Vogel, 1997). For Utkarsh, as for most of the Registry proponents in India and elsewhere, the Registry is a "...tool to establish claims of individuals and local communities and to bring to them an equitable share of benefits flowing from the use of such knowledge and such resources"(1996:3). For other Registry advocates, such as Anil Gupta, although non-IP aims such as the conservation of knowledge and the elevation of I&LK systems into decision making, are important, it is the equitable sharing of benefits that is central to the Registry process. As Gupta states with regards to the long history of unacknowledged sharing of I&LK: "...we have to discuss the issue of recognizing, respecting, and rewarding the contributions of local communities"(1999:1). Finally, as Utkarsh states: "In this world of globalisation, commercialisation and privitization, information is playing a central role in deciding who benefits and at whose cost. Physical, material or economic strengths are no doubt important, but it is the ability to manipulate and control information that is providing the decisive advantage in a competitive world, as never before" (Utkarsh, 1998).

While many of these aims, may not be incompatible with the goals of indigenous and local peoples, the consideration of the concerns raised in this thesis indicate that the emphasis on IP objectives may undermine the non-IP strategies that currently direct many indigenous and local initiatives. If the Registry is to shift from a strategic to a more ontological approach to indigenous and local knowledge protection, it may be that local initiatives that emphasize process

instead of product can facilitate a more dynamic, as opposed to static understanding of indigenous and local peoples. Although this thesis has sought to demonstrate that the Registry may not strictly reflect indigenous and local visions and culture, such a statement, does not preclude the possibility for a reformulated ontological approach to contemporary strategies of control.

Through an exploration of the various spheres of contention surrounding the protection of indigenous and local knowledge in general and the Registry in particular, I have hoped to move beyond a strategic analysis of contesting technical reports, which although important for the articulation of distinct perspectives of the various actors engaged in the debate, have greatly contributed to a mapping of the microbial imaginaries, they have also furthered a supposed rigid boundary between the increasingly polarized debates. Such a rift, I would argue enforces a self/other duality that blurs the dynamic interplay between perspectives. If the varied 'responses' to knowledge protection are to be understood, as R.B.J. Walker suggests, they must not be constructed within the presumed territorial boundaries they seek to encounter.

Indeed a brief historical 'holiday' to the frontier of the old Roman empire, argues Michael Shapiro, is essential for an "...appreciation of Roman 'security' (that) must necessarily displace a strategic approach to geographic strategies with an ontological approach to geographic imaginaries" (1997:xii). If Roman territorialization is to be understood it must be situated within its cosmological and moral construction that moves beyond strategies of securing and patrolling boundaries. The latter approach Shapiro argues throughout his book, has in fact provided egregious misreadings of various cultural practices of space. Hence from an ontological perspective, Roman practices of imperial space, and more specifically '...Roman frontiers were not precise lines of defence or enforcement that radically separated what was Rome from non-Rome. Indeed, despite how often Rome's fall as an empire has been attributed to the

'barbarians' at the gates, Roman frontiers were more zonal than wall-like" (Shapiro, 1997:xii).

The Roman enclosure of sacral space Shapiro reflects, has more to do with their projected sense of control over the periphery than with the actual patrolling of their imagined borders. The importance of such an exploration of the contemporary microbial 'operating systems' has in this chapter sought to illuminate the porous borders of biotechnology that reflect the imaginings of a utopic vision that may perhaps not be enclosed. However, in constructing this vision I was struck by the power of Francis Bacon's utopia, as it provides a lens within the presumed territorial boundaries for understanding the complex issues revolving around the social construction of mechanisms for protection.

Of a variety of possible evolutionary scenarios, the most illuminating reconstruction of the origin of genes is held in a paradox. The first organism must have had some form of genetic mechanism that would ensure its continuity. However, even the most simple of modern organisms are complex. The primal gene it is felt, was probably nothing more than '...a rare, eccentric molecular product of such chemical chaos. But it possessed a singular gift - the power of self-replication" (Suzuki, 1990:11). However this maverick self-replicating molecule introduced with each stage of development, an element of chemical imperfection. This has led to over a billion years of genetic diversity and biological evolution. The reductionist science of modern biotechnology that has arrived in the last second of the evolutionary day could extinguish that singular gift of life.

Appendix A
Research Letter
(Also available in Spanish)

2 August 1999

Dear member of the Yana Yacu Community,

My name is Kate Harrison and I am a Master's Researcher from Canada. I am undertaking my university studies at Carleton University and I am also currently working for the International Development Research Centre in Ottawa, Canada.

In recent months I have been investigating conservation strategies in various parts of the world and recently came across: "The Project for the Recuperation and Development of Indigenous Knowledge for the Conservation of Ecosystems and Biodiversity in the Amazon Forest of Yana Yacu Sacha" that you are currently involved in with the Quichua Biotechnology Institute. Although this project is partially funded by my organization (IDRC) through the Indigenous Knowledge Programme I have come as a student researcher.

I have come to Ecuador to find out more about your conservation and protection strategies. I am interested in exploring issues related to the legal regulation of genetic resources. In particular I am interested in alternative protection mechanisms for the protection of indigenous knowledge and biodiversity. In this sense I have a lot of interest in the activities your community is engaged in, related to the documentation, recuperation and conservation of genetic resources such as the focus of the IQBSS project. I would like to explore with you the effectiveness of these activities for the protection of your rights with regards to activities such as bioprospecting. I have already been in contact with Srta. Rosa C. Vacacela, the director of the IQBSS who has invited me to discuss my research further with the organization and with you as well.

If you are interested in having a personal or group interview with me I would ask that you read and sign the Consent Form that I will provide you with. This form is in order to ensure that your rights are protected with regards to this research. Please feel free to ask me any questions regarding the Consent Form and this research.

A questionnaire is provided that lists the kinds of questions I will be asking you in the interview. I would be interested in visiting the various garden projects and talking to community members that have been or were involved in the project. The interviews will be participatory in nature and will follow a semi-structured format. The interviews can take place wherever is most appropriate for you. Although there is no anticipated risk involved with this research, issues of anonymity and confidentiality are addressed in the Consent Form.

As the purpose of this research is to explore possible knowledge protection mechanisms based on your concerns, perceptions and aspirations your participation in this research is fundamental to the outcome. I will be later analyzing the information you provide within the context of national, regional and international legislation related to genetic resources. The information will contribute to my Master's thesis essay and dissertation and to a report for IDRC, IQBSS and for your community. I will provide Spanish and English copies of the final report to your community and the IQBSS.

Although the Consent Form requires your signature you have the right to withdraw or in an interview, not to answer all questions. In the case of a minor, she/he may withdraw, or the parent/guardian may withdraw on the minor's behalf. Your signature in no way constitutes a waiver of your rights. It is merely documentation that you were informed about what the research would entail, and on this basis, agreed to participate.

My wish is for this research to document your concerns and goals and to contribute to a discussion of possible protection strategies regarding your genetic resources and knowledge.

I hope that you will be able to take part in this research.

Sincerely,

**Kate Harrison
Sustainable Use of Biodiversity
International Development Research Centre
PO Box 8500
Ottawa ON K1G 3H9 Canada
tel) 613 236-6163
fax) 613 567-7749 x2584
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Appendix B
Participatory Research Project
(Also available in Spanish)

**Consent to Participate in Interview
and
Release Interview Information**

I agree to participate in an interview or discussion group about community protection and conservation strategies of biological diversity and associated knowledge and activities related to the “Project for the Recuperation and Development of Indigenous Knowledge for the Conservation of Ecosystems and Biodiversity in the Amazon Forest of Yana Yacu Sacha”.

I will participate in the interview or discussion group under the following conditions:

- ▶ **I will allow the interview to be tape recorded or recorded in writing. I understand the interview is being recorded so that nothing is missed so my words are not changed or misunderstood. I can turn off the tape recorder anytime during the interview.**
- ▶ **I agree to allow Kate Harrison to use the information from the interview or group discussions in the research project, report and publication. However, I understand that my privacy and confidentiality will be protected by disguising names and any other identifying information.**
- ▶ **I understand that I have the right to withdraw, or in an interview not to answer.**

Signature of participant

Signature of researcher

Date

Date

Appendix C
Quichua Biotechnology Institute Questionnaire
(Also available in Spanish)

Introduction of research:

Date:

Location:

Tape recording accepted:

Consent Form Signing:

Name:

Age:

Gender:

What kind of work are you involved in with the IQBSS?

Are you in any way involved with the "Project for the Recuperation and Development of Indigenous Knowledge for the Conservation of Ecosystems and Biodiversity in the Amazon Forest of Yana Yacu Sacha"?

Could you please briefly describe the project in your own words?

Would you be able to briefly elaborate on the community of Yana Yacu?

How has the community been involved in the Project?

Have they been involved with the development of the objectives?

How are or will these objectives be met?

Why does the knowledge of the community members have to be protected?

Who or what does the knowledge and or biodiversity have to be protected from?

Who visits the community? Why?

How does the community respond to these visits?

What do you think of these visits?

Has the community voiced a need to develop a strategy for dealing with visitors?

Has the community voiced a concern for protection?

How will the activities of this project help to protect them?

Are there different kinds of protection?

Is the community involved in other territorial strategies?

How have community members been asserting their rights, territorial or otherwise?

If so, are they different from the strategies of the Project?

What is the community relationship with external agents: organizations, government, other indigenous communities etc?

Is the organization involved in other similar activities. If so where and could you please indicate on the map provided?

Do you have any questions you would like to ask me?

Would you be interested in participating in this particular research project? If so how would you like to be involved?

Appendix D
Yana Yacu Sacha Community Questionnaire
(Also available in Spanish)

Introduction of research:

Date:

Location:

Tape recording accepted:

Consent Form:

Name:

Age:

Gender:

A variety of PLA tools will be used to explore conservation and protection strategies and perceptions of the Yana Yacu community members. The questions that follow may be asked directly or the PLA tool described may be used to explore the same question.

Questions:

What conservation and protection activities are you or have you been involved in?

Are you involved in the IQBSS Project?

In what ways are you involved?

Has your involvement effected your usual activities? How?

Has the project changed conservation and or protection strategies? If so how?

Who was involved in those activities?

How were they involved?

Are they involved in the current project activities?

What is the gender dimension of participation in the project activities?

What was the gender dimension of participation in prior conservation and or protection activities?

PLA tools to be used:

- ▶ **A *Transect Walk*** through the community with community members will involve observation and discussion about their territory. The walk will attempt to cover major ecological, production and social stratified zones of the community.
- ▶ **Visiting the project gardens** are a primary part of the project. These visits will allow me to explore what and why they are gardening.
- ▶ ***Semi-Structured Interviews*** throughout the walk and garden visits will explore the members involvement with the project, daily activities and labour patterns.
- ▶ ***Daily Schedules*** can be used to identify labour patterns and involvement in the project. They can also reveal work distribution and can serve as a comparison between gender and age groups. When explored along an historical timeline they can also reveal how these schedules have changed over time and why.

- ▶ *Community Mapping* also provides a sense of the participants activities and the people and places that they associate with. It may also reveal what is of importance to different people.
- ▶ *Seasonal Calendars* will provide an overview of the participants life over a year and what times they are involved in different activities.
- ▶ *Historical Timelines* will also help to explore any important events or changes in the community from the participants perspective. The timeline can be done through pictures, writing or symbols and could focus on a specific subject or be general in nature. For example changes in the community can be charted, or political or environmental factors can be elaborated.

Questions:

What activities are being conducted with relation to the project?

Why are these activities being conducted?

Who has visited the community? Why?

What do you think of these visits?

Has there been bioprospecting activities? What do you think of these activities?

Assuming that the project has been initiated as a result of these activities, how do you think the project will help to 'protect' your knowledge and resources?

Are there other activities that may also provide 'protection'?

Are you involved in those activities?

What does protection mean to you?

Would you seek the same kind of protection for all knowledge and or resources?

If not how would you categorize your protection system? Along what criteria?

What have you done in the past when someone has sought either knowledge or resources?

How do you think you would respond in the future to such activities?

PLA Tools:

- ▶ *Matrix Ranking* of the selected garden species will be important to exploring the criteria for selection and value. This activity will also help explore the notion of 'protection' through the development of a traditional knowledge framework. The recent use of GIS and Traditional Knowledge Based Systems will be explored further as a method for assessing knowledge systems. A framework would be developed that categorized types of information based on the importance of the information. For example based on the Yana Yacu Classification System of historical places, cultural sites, sacred sites, biophysical resources, plants, animals and trees the Matrix could help to explore the desired availability of the information from completely public sources such as databases to highly private and sensitive information.

Appendix E
Ethics Committee Final Clearance 1999/09/07

Dear Ann Burgess,

Thanks for getting the Ethics Committee Response back to me so quickly. I have responded to each question directly and hope that this will help to clarify my research proposal.

1. The informed consent letter is complex and hard to understand. Can it be satisfactorily communicated to non-professional people?

I believe that the informed consent form can be satisfactorily communicated. The Consent Form basically expresses three important points: 1) the recording of the interview, 2) the use of the information generated and the assurance of confidentiality and 3) the right to withdraw. I believe all of these points to be essential and necessary. These points can be conveyed by the participant reading the form or by reading and explaining the form to the participant. I will be speaking in Spanish to the participants and all documentation will be provided in Spanish as well.

I have already spent some time in Ecuador and have dealt with various indigenous peoples who have demonstrated a high level of understanding in this area. Recently I attended a workshop on the protection of indigenous women's crafts (indigenous women from various parts of South, Central and North America attended) and they also demonstrated a high level of understanding in the area of intellectual property rights. Interestingly enough, the nature of the consent form reflects the very kind of data I am going to Ecuador to collect. Namely how these people wish to protect their knowledge. I realize that this consent form may be difficult to communicate but I believe that it is an important part of the process and I will take the time to communicate it. Given that many indigenous communities have voiced their concern over the intrusion of various 'prospectors', I believe it to be an important part of the development of a community strategy for dealing with researchers such as myself.

2. How long will you spend in the field? The PLA techniques only work after trust has grown, and the techniques themselves take a lot of time.

I will be spending approximately 2 months in the field. I quite agree that the PLA techniques work over time as trust develops. However I have listed the various PLA tools as possible tools that I might use to understand something further. I recently attended a 1 week participatory workshop that explored PLA tools through practical applications and realize that although many of them require time to be truly effective, that some tools are practical and provide a useful means of understanding something further even in a short time period. For example community mapping will help to develop a clearer sense of the community, territory and project concerned. It is in fact a very 'familiar' tool to use to explain your surroundings. Although the use of the tool in this short period of time may not reveal as much as it might when used after a long period of time, it will still be useful in understanding the extent of the project and various territorial issues. It will help to better explain what they are doing and why.

3. The relevance of the field research is not clear. The focus is on legal regimes. The research involves getting local people to educate you about their lives. Is it necessary to put them through this?

The focus of my research is not strictly on existing legal regimes, but on alternative protection mechanisms. In this case the documentation of knowledge in the biodiversity registry is a possible example of one such alternative mechanism. Not a lot has been written on this topic therefore I believe it to be important to find out exactly what these initiatives are about from the people involved in the process, in this case the Yana Yacu Community. Furthermore a lot is being written about how to protect indigenous knowledge at the non-local level and it would appear to be important to speak to indigenous people themselves in order to better understand what they mean by protection. This of course will be contrasted and compared to the policy level discourse in my thesis.

4. The project looks like an IDRC project imperfectly adapted to be a thesis. Will the participants feel free to say no, or be frank, given the Canadian government affiliation? We see the difference and know IDRC is a great and independent organization. Will Ecuadorians?

I would agree that my affiliation to IDRC could be a limitation. In fact I will address this very limitation in my thesis along with any other limitations. However, this very affiliation could also be a strength in that it could ensure greater trust between myself and community members as I will be introduced by the very Indigenous Biotechnology Institute they are working with and are apart of. (Its head quarters are on the territory itself and it is an indigenous run organization.) It would seem to be equally a limitation to have no affiliation at all and to simply plummet into this community as another unknown researcher. I am not going there to evaluate this project per se, (Ie. Is it successful as a project in and of itself.) I am there to find out more about what they are doing, how they are doing it and to what ends. What does 'protection' mean to this community? Why do they need to 'protect' their biological resources and knowledge? How do they think these activities will help to 'protect' them? Although my affiliation to IDRC may affect the results I obtain, I believe that I will still be able to explore the questions raised in my thesis proposal.

I hope that these responses have helped to clarify the points raised by the Committee. I look forward to your response.

Sincerely,

Kate Harrison

**Appendix F
Contact List**

- Institution** **Quichua Biotechnology Institute (IQBSS)**
Address Bosmediano 351 and Bellavista Alta, Quito, Ecuador
tel:265-986
email: ss@hoy.net
- Interviews** 20 September 1999
23 September 1999
- Institution** **Ecociencia**
Address Isla San Cristobal 1523 and Seymour, Quito, Ecuador
tel: 451-696/689/697
- Interviews** 21 September 1999
7 October 1999 & 14 October 1999
- Institution** **Paramo Project**
Address Isla Fernandina N43-41 and de Berlanga, Quito, Ecuador
tel: 02-452-678, 258-220
- Interviews**
Visits 24 September 1999 and visit to project near Riobamba: 27, 28, 29 September 1999
- Interview** 6 October 1999
- Institution** **Proyecto Uso Sostenible de los Recursos Biologicos y Paralegales Comunitarios en el Componente de Politicas y Asuntos Legales del Proyecto (SUBIR - CARE)**
- Address:** Eloy Alfaro 333 and Nueve de Octubre, Quito, Ecuador
tel: 528-696/689/697
- Interview** 4 October 1999
- Institution** **Accion Ecologica, Instituto de Estudios Ecologistas del Tercer Mundo**
Address: Alejandro de Valdez N24-33 and Espanol de la Gasca, Quito, Ecuador
tel: 547-516
- Interview** 11 October 1999
11 October 1999
- Institution** **Centro Ecuatoriano de Derecho Ambiental (CEDA)**
Address: Eloy Alfaro 1770 and Rusia (3rd Floor), Quito Ecuador
tel: 553-646, fax: 231-410/411 email: ceda@uio.satnet.net
- Interview** 18 October 1999
- Institution** **Coordinadora de la Organizaciones Indigenas de la Cuenca Amazonica**
Address: Calle Murgeon 717 and Avenida America, Quito, Ecuador, Casilla: 17-21-753,
tel: 562-753, 545-457, 502-260
email: coica@uio.satnet.net
Http://www.satnet.net/coica
- Interview** 19 October 1999

Institution **Union de Organizaciones y Comunidades de Anyachaya la Esperanza y Caranqui (UNCONIAE-C)**
Address: Via Zuleta Casa Artesanal de Rumipamba, La Esperanza, Imbabura, Ecuador
Interview 21 October 1999

Institution **Federacion Indigena Campesina Imbabura**
Address: Rafael Laura Andinde 15-69, Ibarra, Imbabura, Ecuador
Interview 21 October 1999

Institution **Jambi Huasi Centro de Medicina Alternativa**
Address: Calle Guayaquil 6-19 and Cristobal Colon, Sector Copacabana. Otavalo, Imbabura, Ecuador
tel/fax: 06 921-712
Interview 21 October 1999 & 26 October 1999

Interviews 26 October 1999
26 October 1999
26 October 1999

Institution **Centro de Estudios Pluriculturales (CEPCU)**
Address Atahualpa 760 and Juan Montalvo, Otovalo, Ecuador
Tel/fax: 593-6-921-775, 920-261, Casilla Postal: 182
email: CEPCU@uio.satnet.net
Interview 21 October 1999

Other Organizations Contacted

National Herbarium (15 October)

FLACSO (4 October)

Universidad Catholica (5 October)

Federacion Indigena y Campesina de Imbabura (INRUJTA-FICI), Otovalo, Ecuador (21 October)

Ministerio de Agricultura y Ganaderia (Ministry of Agriculture and Livestock) (Brief Discussion) (25 October)

Abya Yala Publishing House (Several Visits)

Confederacion de Nacionalidades Indigenas del Ecuador (CONAIE) (12 & 13 October)

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