

**“BIODIVERSITY, GENETIC RESOURCES, AND
INDIGENOUS PEOPLES IN AMAZONIA:**

**(RE) DISCOVERING THE WEALTH OF
TRADITIONAL RESOURCES OF NATIVE
AMAZONIANS”**

BY

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INTRODUCTION

Since colonization began, Latin America has provided cheap labour and natural resources for economically dominant countries out of the region. Indeed, the existent class and political systems of Latin America are built upon those who provide these resources. Free access and uncontrolled exploitation of flora, fauna, mineral and water resources have remained critical to the perceived economic interests of Latin American countries.

During the last decade, however, a biodiversity conservation movement has swept Latin America--and the rest of the world. Increasingly, countries like Brazil, Costa Rica, Colombia, and Mexico have become aware of the economic interests Northern countries have in their biodiversity. Some countries, like Bolivia, Ecuador, and Peru had already benefited from debt-for-nature swaps, but the “green funds” that were being transferred from non-governmental organizations (NGOs) in the First World to NGOs within their borders defied governmental controls and led to suspicions that environmentalism was only a cover for foreign takeover of national lands and resources. Thus, traditionally, biodiversity and environmental interests have been viewed with suspicion, or even as threats to national sovereignty.

Meanwhile, corporate interest in new products and genetic materials found in the components of biological diversity has led to a proliferation of “biodiversity prospecting”¹ (Reid *et al*, 1993; Joyce, 1994; Chadwick & Marsh (ed.), 1994; Posey, 1995). Frequently cited figures indicating enormous market potential, such as US\$ 43 billion per year for sales of natural-product based pharmaceuticals (Principe, 1989), US\$ 50 billion per year for seeds derived from traditional crop varieties (RAFI, 1994: 19), and similar figures for other natural compounds, led Latin American countries to re-evaluate attitudes toward the value of their flora, fauna, and natural resources. It seemed that the traditional governmental policies that provoked the unbridled environmental devastation of tropical ecosystems might, after all, be contrary to national interests for long term economic growth built upon biotechnology. (Table 1 gives a summary of past and present contributions of biodiversity rich countries to humanity.)

¹ The search for commercially valuable genetic and biochemical resources, with particular reference to the pharmaceutical, biotechnological and agricultural industries (Posey & Dutfield, 1996: 14).

TABLE 1: Examples of the past and present contribution of biodiversity-rich countries to humanity: a few examples

Pharmacy	Industry	Agriculture and food
<p>Anti-cancer drugs: <i>the vinca alkaloids</i></p> <p>Tranquilizers and heart drugs: <i>reserpine</i></p> <p>Birth control: <i>Dioscorea</i> (source of many steroidal drugs)</p> <p>Anaesthetics and surgical aids: <i>cocaine, teterodoxin, d-tubocurarine, picrotoxin, madecassol, gum gutta percha</i></p> <p>Ophthalmology and neurology: <i>physostigmine, pilocarpine, atropine, hyoscine</i></p> <p>Respiratory disorders: <i>emetine, tolu balsam, benzoin tincture, l-dopa, sarsapogenine, catechin, camphor</i></p>	<p>“Wild” relatives of plantation and other species for “improvement”/ protection</p> <p>Exudates: <i>latexes, waxes, resins, tannins, dyes, insecticides (neem, pyrethrins, rotenone)</i></p> <p>Fibres and canes: <i>rattan, bamboos, jute, sisal, kapok</i></p> <p>Edible and industrial oils: <i>palm oils, castor oil</i></p> <p>Essential oils: <i>sandalwood, ylang ylang, sassafras, camphor, anise, nutmeg, vanilla, cinnamon, clove, patchouli, cassia</i></p> <p>Energy plants/biomass conversion: <i>biomethanation, fermentation to produce ethanol, pyrolysis</i></p>	<p>“Wild” relatives of crops for “improvement”/ protection</p> <p>Beverages, sugar, natural sweeteners: <i>coffee, tea, cocoa, sugar cane, thaumatin</i></p> <p>Beans</p> <p>Roots and tubers: <i>cassava, yam, sweet potato</i></p> <p>Fruits and Vegetables: <i>tomato, avocado, sweet pepper, aubergine, cucumber, breadfruit, okra</i></p> <p>Spices: <i>cloves, nutmeg, black pepper, allspice, cardamom, vanilla, cinnamon</i></p> <p>Nuts: <i>brazil, peanut, cashew, kola, sesame, macadamia</i></p> <p>Animals: <i>chickens, wild pigs, water buffalo</i></p>

Dutfield, 1993 (Based on information in Friends of the Earth, 1992).

Furthermore, industry was not only interested in genetic resources, but also in traditional knowledge held by local communities on the utilization of flora and fauna (Gray, 1991; RAFI, 1994; Chadwick & Marsh, 1994; Posey & Dutfield, 1996; Balick *et al* (eds.), 1996). Companies like Shaman Pharmaceuticals and The Body Shop found that research and development costs could be cut by as much as 40%, which -- given that a single new medicine can cost over US\$ 200 million to develop -- represents not inconsiderable savings (DiMasi *et al*, 1991).

Throughout the history of Latin America, indigenous and traditional peoples (campesinos, caboclos, peons, colonos, caicaras, etc) have been treated--at best--with disdain by the ruling elite (Wolf & Hansen, 1972; Wolf, 1982). It was not until the 17th Century that “Indios” were considered to be humans with souls; and most western scientists still believe traditional knowledge is folklore and not scientific. In short, these “backward and primitive” peoples are barriers to development, learning and civilization. Armed with those assumptions, governments--and even scientists and environmentalists--have found it easy to justify the dispossession of Indians and peasants from their land and resources in the name of development, conservation, and progress.²

It is not surprising, therefore, that Latin American countries find it difficult to respond to the political and economic problems raised by the global biodiversity debate. In short, how can 500 years of policy to systematically “tame” (read: destroy) the environment and indigenous and traditional communities be reversed in time to protect flora, fauna and the people who know the “secrets” to this new source of national wealth? In other words: how can environment and biodiversity--until recently considered subversive concepts--be embraced without undermining the power of the old land-based oligarchies and extractive industries whose survival depends on cheap natural and human resources?

As Latin American countries struggle with these questions, biodiversity prospectors invade the most remote corners of jungles, mountains, and coastal reefs--gleaning from the public domain everything they can before national legislation can regulate access and transfer of genetic resources and traditional knowledge. By the time most Latin American countries do get around to legislating on genetic resources and traditional knowledge, the more aspirant and persistent corporations may feel they will have all they need for the development of new products for a long time to come. “What’s a *poor* country, *rich* in biological and cultural diversity to do?”

INDIGENOUS AND LOCAL COMMUNITIES IN CONSERVATION

The concept of sustainability is embodied in indigenous and traditional livelihood systems (Posey & Dutfield, 1997). Historical evidence exists which demonstrates the sustained productivity of indigenous systems in some cases for thousands of years on the same land.³

² A recent publication of the World Rainforest Movement (Colchester & Watson, 1995) documents how the indigenous situation has rapidly deteriorated in Venezuela. Similarly, recent announcements in Brazil indicate that the Congress is about to re-study the existing indigenous reserves: a euphemism for reducing indigenous lands and territories to even smaller portions of the country than now exist.

³ For examples, see D.A. Posey & W. Balée (eds.) (1989) *Resource Management in Amazonia: Indigenous and*

Indigenous peoples and traditional communities often possess a ‘conservation ethic’⁴ developed from living in particular ecosystems (Bierhorst, 1994; Callicott, 1989). This ethic cannot be regarded as universal, but indigenous systems do tend to emphasise the following specific values and features (Posey & Dutfield, 1997):

- cooperation;
- family bonding and cross-generational communication, including links with ancestors;
- concern for the well-being of future generations;
- local-scale, self-sufficiency, and reliance on locally available natural resources;
- rights to lands, territories and resources which tend to be collective and inalienable rather than individual and alienable;⁵
- restraint in resource exploitation and respect for nature, especially for sacred sites.

The ‘traditional knowledge, innovations and practices’ of ‘indigenous and local communities embodying traditional lifestyles’ are often referred to by scientists as Traditional Ecological Knowledge (TEK).⁶ TEK is far more than a simple compilation of facts. It is the basis for local-level decision-making in areas of contemporary life, including natural resource management, nutrition, food preparation, health, education, and community and social organisation. TEK is holistic, inherently dynamic, constantly evolving through experimentation and innovation, fresh insight, and external stimuli. Scientists are becoming increasingly aware of the sophistication of TEK among many indigenous and local communities. For example, the Shuar people of Ecuador’s Amazonian lowlands use 800 species of plants for medicine, food, animal fodder, fuel, construction, fishing and hunting supplies (Durning, 1992: 29). Traditional healers may rely on thousands of medicinal plants, and shifting cultivators throughout the tropics frequently sow more than 100 crops in their forest farms (Ibid).

Folk Strategies. Advances in Economic Botany, No. 7. New York: New York Botanical Garden; D.M. Warren, L.J. Slikkerveer, and D. Brokensha, eds. (1995) *The Cultural Dimension of Development: Indigenous Knowledge Systems*. London: Intermediate Technology Publications; D. Brokensha, D.M. Warren, and O. Werner, eds. (1980) *Indigenous Knowledge Systems and Development*. Lanham, MD: University Press of America; D.A. Posey and G. Dutfield (1996) *Indigenous Peoples and Sustainability: Cases and Actions*. Utrecht and Gland: International Books and International Union for Conservation of Nature.

⁴ Johannes and Ruddle define ‘conservation ethic’ as ‘...an awareness of people’s ability to deplete or otherwise damage natural resources, coupled with a commitment to reduce or eliminate the consequences’ (R.E. Johannes and K. Ruddle (1993) ‘Human Interactions in Tropical Coastal and Marine Areas: Lessons from Traditional Resource Use’. In A. Price and S. Humphreys, eds. *Applications of the Biosphere Reserve Concept to Coastal Marine Areas*. Gland: IUCN. Pp. 19-25).

⁵ According to Gray (A. Gray (1994) ‘Territorial Defence as the Basis for Indigenous Self-development’. *Indigenous Affairs*, 4, pp. 2–3): ‘Indigenous land rights are based on a people’s prior occupation of an area, usually before a state was even formed. In this sense, Indigenous peoples have a claim to ‘*eminent domain*’ (inalienability) which a state usually considers to be its own exclusive right.... Connected with the concept of inalienability is the collective responsibility which a people has for its territory. This does not mean that individual persons cannot hold lands and resources for their own use, but that personal ownership is based on collective consent. The collective rights to lands and resources of Indigenous peoples have been acknowledged by many governments of the world in their constitutions and in international provisions’.

⁶ Defined by Gadgil *et al* (M. Gadgil, F. Berkes and C. Folke (1993: 151) (‘Indigenous Knowledge for Biodiversity Conservation’. *Ambio*, 22(2-3), pp. 151-156) as ‘A cumulative body of knowledge and beliefs handed down through generations by cultural transmission about the relationship of living beings, (including humans) with one another and with their environment’.

A failure to understand the human-modified nature of 'wild' landscapes, including those which are sparsely populated at the present time, has blinded outsiders to the management practices of indigenous peoples and local communities (Gomez-Pompa & Kaus, 1992). Many so-called 'pristine' landscapes are in fact *cultural landscapes*, either created by humans or modified by human activity--such as natural forest management, cultivation, and the use of fire (Balee 1996; Denevan, 1992; Posey 1997).⁷ Indigenous peoples and a growing number of scientists believe that it is no longer acceptable simply to assume that just because landscapes and species appear to outsiders to be 'natural', they are therefore 'wild'. According to a Resolution sponsored by Aboriginal peoples at the 1995 Ecopolitics IX Conference in Darwin, Australia:⁸

The term 'wilderness' as it is popularly used, and related concepts as 'wild resources', 'wild foods', etc., [are unacceptable]. These terms have connotations of *terra nullius* [empty or unowned land and resources] and, as such, all concerned people and organisations should look for alternative terminology which does not exclude Indigenous history and meaning.

For indigenous peoples forests are far more than just a source of timber. Most traditional peoples who inhabit forests or areas close to forests rely extensively upon hunted, collected, or gathered foods and resources, a significant portion of which are influenced by humans to meet their needs. These species non-domesticated resources--sometimes also known as 'semi-domesticates' or 'human modified species' (Posey, 1994a, 1997)--form the basis for a vast treasury of useful species that have systematically been undervalued and overlooked by science, yet provide food and medicinal security for local communities around the world.⁹ In many communities children supplement their vitamin requirements by gathering fruits, and seeds in the forests. In many countries there are ancient forest groves which are sacred places dedicated for rituals, which may also be used for burial sites, and as sources of medicinal plants. Such sites have been found to have conservation importance for the communities and to provide other environmental benefits (Posey and Dutfield, 1997).

Indigenous peoples plant forest gardens and manage the regeneration of bush fallows in ways which take advantage of natural processes and mimic the biodiversity of natural forests.¹⁰ Much of the world's crop diversity is in the custody of farmers who follow age-old farming and land use practices that conserve biodiversity and provide other local benefits. Among such benefits are the promotion of indigenous diet diversity, income generation, production stability, minimisation of risk, reduced insect and disease incidence, efficient use of labour, intensification of production with limited resources, and maximisation of returns under low levels of technology. These ecologically complex agricultural systems associated with centres of crop genetic diversity include traditional cultivars or 'landraces' that constitute an essential part of our world crop genetic heritage, and non-domesticated plant and animal species that

⁷ According to the Four Directions Council (1996): '...the territories in which indigenous peoples traditionally live are **shaped environments**, with biodiversity as a priority goal, notwithstanding the fact that the modifications may be subtle and can be confused with the natural evolution of the landscape'.

⁸ Northern Land Council (1996) *Ecopolitics IX: Perspectives on Indigenous Peoples' Management of Environmental Resources*. Casuarina, NT: NLC, p.166.

⁹ Such useful species provide most of the foods, medicines, oils, essences, dyes, colours, repellents, insecticides, building materials and clothes needed by a local community.

¹⁰ For examples, see A.B. Anderson (ed.) (1990) *Alternatives to Deforestation: Steps Toward Sustainable Use of the Amazon Rain Forest*. New York: Columbia University Press.

serve humanity as biological resources. There are numerous categories of traditional knowledge among indigenous peoples, which clearly have great potential for application in a wide range of sustainability strategies. Indigenous peoples conserve biological diversity, and in some cases provide other environmental benefits, for example, soil and water conservation, soil fertility enhancement, and management of game and fisheries (Posey & Dutfield, 1997).

THE CONVENTION ON BIOLOGICAL DIVERSITY AND IPRS

The Convention on Biological Diversity (CBD) was opened for signature during the United Nations Conference on Conservation and Development (UNCED) in Rio de Janeiro in 1992. It is considered by indigenous peoples to be a sovereignty grab by nation states over all biological and ecological resources.

Objectives of the Biodiversity Convention, as stated in Article 1 are:

...the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies, and by appropriate funding.

Rights refers to the sovereign rights of States. Similarly the beneficiaries of equitable sharing are apparently the contracting parties, i.e. the nation states that ratify the CBD), not individuals or communities. It is important to note, however, that “relevant technologies” can be interpreted to mean “indigenous and traditional technologies” (in reference to the language of Article 18.4 in the “Access to and Transfer of Technology” Section), or those based upon traditional “knowledge, innovations and practices” (in reference to language used in Article 8.j).

Article 8.j states that each Contracting Party must:

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 the wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.

While indigenous peoples might be flattered with the recognition of their relevance to *in situ* conservation, they are hardly convinced that the governments that have tried so hard to destroy them and their habitats are now suddenly going to zealously defend their rights. They are also not convinced that—given their negative experiences in the past--any “equitable sharing” will ever trickle down to the source of both the knowledge and resource, i.e., their communities. Indigenous leaders are both frustrated and angry that while Amazonian countries do little to protect their interests or guarantee even their most basic rights, they are

nonetheless now anxious to claim sovereignty over even local knowledge systems.

Intellectual property rights (IPRs) are assumed by the CBD to be the principal mechanisms to provide “equitable sharing”, but IPRs are problematic for developing countries in general--and indigenous, traditional and local communities in particular--for the following reasons:

(i) they are intended to benefit society through the granting of exclusive rights to “natural” and “juridical” persons or “creative individuals”, not collective entities such as indigenous peoples.

A group of lawyers, academics and activists recently summed up the situation thus¹¹:

Contemporary intellectual property law is constructed around the notion of the author as an individual, solitary and original creator, and it is for this figure that its protections are reserved. Those who do not fit this model--custodians of tribal culture and medical knowledge, collectives practicing traditional artistic and musical forms, or peasant cultivators of valuable seed varieties, for example--are denied intellectual property protection.

(ii) they cannot protect information that does not result from a specific historic act of “discovery”. Indigenous knowledge is transgenerational and communally shared. Knowledge may come from ancestor spirits, vision quests, or orally-transmitted lineage groups. It is considered to be in the “public domain” and, therefore, unprotectable.

(iii) they cannot accommodate complex non-western systems of ownership, tenure, and access. IPR law assigns authorship of a song to a writer or publishing company that can record or publish as it sees fit. Indigenous singers, however, may attribute songs to the creator spirit and elders may reserve the right to prohibit its performance, or to limit it to certain occasions and to restricted audiences.

(iv) they serve to stimulate commercialisation and distribution, whereas Indigenous concerns may be primarily to prohibit commercialisation and to restrict use and distribution. As a 1994 COICA (The Coordinating Group of the Indigenous Peoples of the Amazon Basin) statement puts it:

For members of indigenous peoples, knowledge and determination of the use of resources are collective and inter-generational. No indigenous population, whether of individuals or communities, nor the government, can sell or transfer ownership of resources which are the property of the people and which each generation has an obligation to safeguard for the next.

(v) they recognise only market economic values, failing to consider spiritual, aesthetic, or cultural--or even local economic--values. Information or objects may have their greatest value to indigenous peoples because of their ties with cultural identity and symbolic unity.

(vi) they are subject to manipulation to economic interests that wield political power. *Sui generis* protection has been obtained for semi-conductor chips and “literary works” generated

¹¹ The 1993 Bellagio Declaration. In: Boyle, J., 1996. *Shamans, Software and Spleens: Law and the Social Construction of the Information Economy*. Cambridge: Harvard University Press.

by computers (Cornish, 1993), whereas indigenous peoples have insufficient power to protect even their most sacred plants, places, or artefacts.

(vii) they are expensive, complicated, and time-consuming to obtain, and even more difficult to defend.

There are good reasons why indigenous peoples are worried that intellectual property rights cannot protect their knowledge and resources. Take for example, the case of *tiki uba*.

In a 1988 issue of *National Geographic Magazine*, Loren McIntyre describes the 'Last Days of Eden' for the 350 members of the Amazonian Urueu-Wau-Wau tribe. They are portrayed as being vulnerable to diseases carried by outsiders and trying to resist the encroachments of settlers on their lands. Three photos on one of the pages, one of which shows a tapir bleeding from an arrow wound, are accompanied by the following caption (McIntyre 1988:807):

Secrets of rain forest chemistry provide a feast for the Urueu-Wau-Wau. Using poison arrows, they down a young tapir that bubbled into their village at night. Wooden arrow points are coated with sap squeezed from the stringy red bark of tiki uba trees and hardened by fire. An anticoagulant, tiki uba causes victims to bleed to death. In addition to such deadly jungle lore, knowledge of potentially useful foods and drugs, accumulated over thousands of years, may be lost forever if the forest and its inhabitants disappear."

Jesco von Puttkamer, who took photographs which accompanied the article, was quoted as saying in reference to the plant: 'I think it may be a great pharmaceutical find' (ibid:816). This article attracted the attention of researchers working for the US pharmaceutical company Merck, and von Puttkamer agreed to send them bark and sap specimens in order for them to carry out tests (Jacobs *et al* 1990:31). These tests confirmed that the bark contained at least one compound that inhibited enzymes that cause blood clotting and efforts immediately began to commercialize a product useful in heart surgery.

McIntyre and von Puttkamer felt they were acting in the best interests of humankind when they described the *tiki uba* in their article. However, by doing so they made it possible for a drug company to appropriate their knowledge without any obligations to compensate the Urueu-Wau-Wau, who, in their present situation could well find compensation highly beneficial (Posey, Dutfield & Plenderleith, 1995).

Another example is illustrated by the exploitation of a plant called *Pilocarpus jaborandi* to treat glaucoma. Although Brazil now earns US \$25 million a year from exporting the plant, the Guajajara indians who originally provided the "lead" that led to the "discovery" of the plant by ethnobotanists now suffer from debt peonage and slavery at the hands of agents of the company involved in the trade. Furthermore, the species itself is being rapidly exhausted by unsustainable collecting practices (Davis, 1993; Pinheiro, in press).

Yet another example of commercial exploitation of indigenous resources is the case of patents on indigenous cell lines. Indigenous peoples are particularly disturbed about the "discoveries" made from blood samples (WCIP, 1993). Under the guise of "good science", the Human Genome Organization (HUGO) and one of its subsidiary projects (the Human Genome Diversity Project), coordinate the collection of blood samples from isolated

communities like those in Amazonia that are “threatened with extinction” (Cavalli-Sforza *et al.*, 1991). The results will supposedly reveal evolutionary links and identify genetic sequences for gene therapy to improve human health (HUGO, 1994).

The “Vampire Project”, as it is known by indigenous peoples (WCIP, 1993) has brought much discredit to scientific research because, once collected, data and cells are available for commercial exploitation. It is likely that collections will be made without the prior informed consent of the sample groups. Indigenous peoples around the world have condemned the Project.¹²

At least three patent applications have been made for cell lines developed from blood “donated” by indigenous peoples, including one from a member of a recently-contacted group of hunter-cultivators in New Guinea, another from the Solomon Islands, and a third from the Guaymi Indians of Panama (Posey & Dutfield, 1996: 25-27). The patent applicant in each case is the US National Institutes of Health, with the government scientists involved in the project named as inventors.

These examples illustrate why indigenous communities are less than enthusiastic about and trustful of scientists. In a now famous declaration from a UNDP *Consultation on the Protection and Conservation of Indigenous Knowledge* organized by indigenous groups from Boliva and COICA at Santa Cruz de la Sierra in September, 1994, indigenous leaders declared a moratorium on all research and bioprospecting until appropriate protection measures are in place.¹³

The threat of a moratorium is unnerving, since scientists and research institutions are increasingly dependent upon the private sector for their livelihoods. This means the fruits of their labours are subject to commercial exploitation, or indeed, are now designed for that purpose (Posey, 1995). It is often hard for scientists themselves to know when they must wear the hat of their patrons versus the mantle of their scientific discipline. From the indigenous perspective, they (we) are all the same. This means that negotiating access by scientists to indigenous and local communities--whether for bioprospecting or scientific purposes--may take considerable time and energy and has become a profoundly political act (Posey, Dutfield & Plenderleith, 1995).¹⁴

The private sector and scientific interests are eager that the CBD resolve these dilemmas to become an international vehicle for clarification of the terms of access for and transfer of genetic resources and appropriate technologies. Indeed, the CBD has advanced considerably towards the development of guidelines and principles for *sui generis* options to existing IPRs. The Third Conference of the Parties (COP III) of the CBD discussed Article 8.j and Intellectual Property Rights and agreed to “develop national legislation and corresponding strategies for the implementation of Article 8.j in consultation with representatives of their

¹² For example, indigenous groups from North and South America meeting in February 1995 promulgated a statement which vigorously condemned the Project. This statement is known as the Declaration of Indigenous Peoples of the Western Hemisphere Regarding the Human Genome Diversity Project.

¹³ The Statement is printed as Appendix 10, pp 219-222, in Posey & Dutfield, 1996.

¹⁴ Significantly, some indigenous groups already have their own policies and regulations addressing the need to control access to their territories, to monitor the activities of plant collectors and researchers, and to become beneficiaries of plant collections and research. Examples in Latin America are the Kuna of Panama and the Awa of Ecuador (see Posey & Dutfield, 1996).

indigenous and local communities” (Decision III/14). An inter-sessional *Workshop on Traditional Knowledge and Biodiversity* was held in Madrid in November, 1997, and proposed to COP-IV that a “participatory mechanism” be established to review legal elements related to benefit-sharing and traditional cultural practices for conservation and sustainable use. COP-IV (Decision IV/8) agreed to establish a “regionally balanced panel of experts” to develop a “common understanding of basic concepts and to explore all options for access and benefit sharing on mutually agreed terms including principles, guidelines, and codes of best practices for access and benefit sharing arrangements”. Decision IV/9 on *Implementation of Article 8(j) and Related Provisions* specifically recognised the “importance of making intellectual property-related provisions of the Convention on Biological Diversity and provisions of international agreements relating to intellectual property mutually supportive, and the desirability of undertaking further cooperation and consultation with the World Intellectual Property Organization”. The decision also agreed to establish an “*ad hoc* open-ended inter-sessional working group” to address IPR and issues related to Article 8.j¹⁵.

Whatever the CBD recommends, however, it is important to remember that States themselves are responsible for adequate national legislation to govern access to and transfer and use of their genetic resources and traditional technologies within their sovereign boundaries. The following section looks at some efforts in Latin American and Amazonian countries.

NATIONAL AND REGIONAL INITIATIVES

A number of initiatives are underway in Latin American and Amazonian countries to find adequate protection of genetic and knowledge. The overall goal is to find legal ways of sustainably exploiting biodiversity in a commercial, yet equitable manner. Most of what is happening in Amazonia has been guided by experiences in other parts of Latin America, for example:

1. *Costa Rica*

Costa Rica is hardly an Amazonian country, but it has led the way in Latin America (and beyond) on issues of access and transfer legislation, equitable benefit-sharing, and protection of genetic resources. Perhaps the best known example of “equitable arrangements” is the Merck-INBio agreement. The National Biodiversity (INBio), an NGO closely linked with the government, was established to carry out a species inventory of the country and to explore the commercial potential of biological resources with corporations through Material Transfer Agreements (MTAs). According to Costa Rican law, the biological diversity of the country on public and private lands is national patrimony and the State has the exclusive right to grant permits to organisations such as INBio to investigate, collect and exploit the country’s biological resources within its Conservation Areas¹⁶.

¹⁵ Dutfield, G. 1998, “*Background Paper on Intellectual Property Rights in the Context of Seeds and Plant Varieties*”, an unpublished Report for the IUCN Project on The Convention on Biological Diversity and The International Trade Regime, IUCN/Gland.

¹⁶ For greater detail, see Posey & Dutfield, 1996, *Beyond Intellectual Property Rights*, IDRC.

The agreement between Merck and INBio provides the latter with an advanced payment of \$1 million and royalties in case a product is derived from any of the extracts which INBio will transfer to Merck. 50% of the royalties are to be forwarded to the government's National Parks Fund.

There were several problems with this initial approach:

i) The government claims sovereignty over the country's biodiversity and does not recognise the territorial and resources rights of indigenous peoples and local communities.

ii) INBio has secured prospecting rights to lands which according to national laws are under State ownership, permitting very little in the way of local control. In fact, the Director of INBio was unaware that there were indigenous peoples in the country--although the agreement was for collecting on national lands, including those of eight indigenous peoples.

iii) Although the agreement with Merck provides benefits for the government and for INBio, no benefits will go to local communities except for the training of a small of "para-taxonomists". Furthermore, INBio will not contribute at all to revitalising local knowledge traditions because it professes to have no interest at all in such knowledge.

iv) Although the advance payment by Merck seems substantial, it is hardly generous; neither are the agreed royalty percentage of between 3-4%).

v) There is no provision in the agreement for co-ownership of patents (Joyce, 1994: 126-127). Therefore, Merck will have exclusive intellectual property rights.

Since this historic agreement, INBio has made numerous other agreements with Merck and other pharmaceutical and natural product companies that have confronted some of these basic problems (Mateo 1998). The Merck-INBio experience was instrumental in development of Costa Rica's new (April, 1998) *Ley de Biodiversidad*, which has become one of the "most ambitious and elaborate national laws" for Latin America (Dutfield, 1998). The *Ley de Biodiversidad* seeks to implement the provisions of the CBD and to develop "a *sui generis* system to protect the intellectual rights of indigenous peoples and local communities" (ibid). There are 13 overall objectives of the *Ley*, summarised below, and these will surely be influential in guiding legislative activities in Amazonian countries attempting to control the loss of genetic and knowledge resources from the region.

Principles and objectives of the *Ley de Biodiversidad* (Costa Rica, 1998)

General principles

1. *Respect for all forms of life* – all living things have the right to life independent of their actual or potential economic value.
2. *The elements of biodiversity are meritorious* – they have decisive and strategic importance for the country's development and are essential for the domestic, social, cultural and aesthetic use of its inhabitants.
3. *Respect for cultural diversity* – the diversity of cultural practices and associated knowledge of biodiversity elements must be respected and promoted, in conformity with national and international juridical standards, particularly in the case of peasant communities, indigenous peoples and other cultural groups.
4. *Intra- and inter-generational equity* – the State and private individuals will ensure that biodiversity elements are utilised sustainably in such a way that the possibilities and opportunities from their use and the benefits are guaranteed in a just manner for all sectors of society and to satisfy the needs of future generations.

Objectives (selected)

1. To integrate conservation and sustainable use of biodiversity elements into the development of socio-cultural, economic and environmental policies.
2. To promote active participation of all social sectors in conservation and ecologically sustainable use of biodiversity, in pursuit of social, economic and cultural sustainability.
3. To regulate access and facilitate equitable distribution of social, environmental and economic benefits for all sectors of society, with special attention to local communities and indigenous peoples.
4. To recognise and compensate the knowledge, innovations and practices of indigenous peoples and local communities for conservation and ecologically sustainable use of biodiversity elements.
5. To recognise rights arising from the contribution of scientific knowledge for conservation and ecologically sustainable use of biodiversity elements.
6. To promote access to biodiversity elements of biodiversity and technology transfer.
7. To foster international and regional cooperation to achieve conservation, ecologically sustainable use and distribution of benefits derived from biodiversity, especially in frontier areas or shared resources.

From: G. Dutfield, 1998 (IUCN Report)

2. The Andean Pact

Some Latin American countries, for example the Andean Pact countries, have responded with draft legislation intended to establish equitable terms for granting access to genetic resources and sharing benefits with indigenous peoples. The Andean Community *Common System on*

Access to Genetic Resources was adopted by member states (Bolivia, Colombia, Ecuador, Peru and Venezuela) in 1996.

The basic terms of the Common System include:

- i) sharing of benefits between receivers of biological resources, members states and providers, which may be legal entities, private individuals, or indigenous or local communities;
- ii) restrictions on transfer to third parties;
- iii) reporting on obligations on future uses;
- iv) obligations related to intellectual property;
- v) exclusivity and confidentiality;
- vi) recognition of the Member States or provider in the publication of research results.

Member States would recognise the rights of indigenous and local communities over their knowledge, innovations and practices, and would concede to local communities the “authority to decide whether and how to share such knowledge, innovations and practices”.

Andean Pact countries, as well as Brazil, ascribe biodiversity to the national patrimony. However, it is unclear if States (governments) have the exclusive rights to determine access and set terms for transfer and benefit-sharing. It is equally unclear what authority local, state and regional governments have *vis a vis* national or federal governments. In the absence of clear laws on genetic resources, most countries find they are incapable of limiting access or even monitoring activities within their borders.

One very significant aspect of the Andean *Common System on Access to Genetic Resources* is that protection is extended to **derivatives**, which are defined as “a molecule or combination of mixture of natural molecules, including raw extracts of living or dead organisms of biological origin, derived from the metabolism of living organisms” (Dutfield, 1998). Although this does not cover synthetic products developed from artificial processes using genetic information or molecules, it does claim ownership over compounds that are isolated from nature, even if the laboratory work is done outside the Andean countries.

The *Common System* also recognises “intangible components”, such as “knowledge, innovations, and practices” (individual or collective) that are of actual or potential value. These components--*and their derivatives*--are also protected and regulated by national laws, which require legally recognised licenses and contracts registered with the “Competent National Authority”. Any and all products, patents or claims that do not have such a license are not protectable nor recognised by Andean countries.

It should be noted that, in addition to the *Common System*, some Andean countries are experimenting with other forms of Intellectual Property Rights. For example, Ecuador has taken steps to establish a “biodiversity cartel” that would claim monopoly rights by the State over all biological diversity. The genetic resources would be protected under *trade secret* law

and licensed for royalties to interested users (Vogel, 1996)¹⁷. In Peru, the Aguaruna people have utilised *know-how* law to successfully license their traditional knowledge for the use of genetic resources by an International Cooperative Biodiversity Group Program (ICBG) project with Washington University (USA), two Peruvian Universities and Searle & Co. pharmaceuticals, which is part of Monsanto (Tobin, 1996)¹⁸.

3. BRAZIL

One of the first and most historic attempts in Amazonia to implement the CBD in a manner that would support the objectives of Article 8.j occurred in Brazil with Proposed Law (PL 2057/91). The proposal was approved in 1994 by the Chamber of Deputies of the national legislature, but has never passed into the Senate and is still under consideration for its constitutionality. The proposed law is intended to protect and assure respect for indigenous peoples' social organisation, customs, languages, beliefs and traditions, and rights over their territories and possessions.

Articles 18-29 deal with the intellectual property of indigenous peoples. Among the important provisions of potential benefit to indigenous peoples are the following:

- the right to maintain the secrecy of traditional knowledge;
- the right to refuse access to traditional knowledge;
the right to apply for IPR protection, which, in the case of collective knowledge will be granted in the name of the community or society;
- the right of prior informed consent (to be given in writing) for access to, use of and application of traditional knowledge;
- the right to co-ownership of research data, patents and products derived from the research but without the community having to pay patent fees;
- and, the right of communities to nullify patents illegally derived from their knowledge.

The Act would redefine patents and copyright by allowing community IPR to continue without time limit.

There is little surprise that such a revolutionary bill would have run into troubles in the Brazilian Congress, especially given the heavy and unrelenting pressures from industrial countries to implement a standard (U.S. style) IPR regime¹⁹. Brazil has had patent law since 1887 and established a National Institute for Industrial Property (INPI) in 1971 to administer

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¹⁹ Considerable information can be obtained on the political processes (civil and governmental) by checking the materials distributed by David Hathaway, who coordinated the genetics network of Brazil. Contact address: hathaway@netflash.com.br

its “modern” Industrial Property Code (Law 5772/71). This law was replaced in May, 1997, by Law 9297 that “streamlines” industrial property protection and strengthens patents for industrial property²⁰. There is no mention of collective property, community resources, or traditional technologies of indigenous and local peoples.

During the past two years, however, Senadora Marina da Silva has sponsored public hearings throughout Brazil on legislation governing access to genetic resources. These hearing have led to a greater public understanding of “biopiracy” and “bioprospection”—and, along with it, a growing concern about how Brazil, and more specifically, Brazilians are being “ripped off”²¹. The Senadora’s findings have been encompassed in Lei 306/95 governing “Acesso aos Recursos Biologicos e Geneticos”, which was approved by the Senate in June, 1998, but has yet to be debated by the House of Deputies. There is a proposal by the Casa Civil to remove reference to community and property rights for indigenous and traditional communities, again, it is claimed, so as not to conflict with existing industrial property legislation²².

Under the Brazilian Constitution of 1988, federal States have greater autonomy. The State of Acre, tired of awaiting national action, enacted its own *Lei de Acesso aos Recursos Geneticos* (Projeto de Lei No 15/97) in 1997. The law draws upon the Andean *Common System* and the PL 2057/91. It recognises the collective rights of indigenous and local peoples over their genetic resources and traditional knowledge. It also regulates collection of genetic materials for “research, bioprospecting, conservation, industrial application, commercial use, and other purposes” and requires equitable and adequate benefit-sharing from such materials and collections. The Secretaria de Estado de Ciencia, Tecnologia e Meio Ambiente (SECTMA) do Acre becomes the body responsible for licensing, monitoring, and initiation of legal action, since one of the most interesting and historical aspects of the Lei is that infringements of the law carry *criminal penalties*.

In November, 1997, Deputada Socorro Gomes (Para) presided over the Comissao Externa Criada para Apurar Denuncias de Exploracao e Comercializacao Ilegal de Plantas e Material Genetico na Amazonia, which reports to a special Comissao de Biopirararia. The report calls for more rigorous laws to control “Biopiracy”, including expanded criminal charges for unauthorised collection, exploitation, and use of genetic resources and traditional knowledge about them.

The idea that genetic resources and traditional ecological knowledge are resources for States and the Union is indeed a major change in the history of Brazil—and, indeed, of Latin America. Until very recently it would have been inconceivable that a Congressional Commission would be established to investigate illegal exploitation of plants, animals and traditional knowledge. It seems that times have indeed changed in Amazonia!

CONCLUSIONS

²⁰ A critique of this law and other implementing mechanisms (regulatory acts), as well as complete texts of the law in English, French and Portuguese, can be found on the INPI Web Site: <http://www.inpi.gov.br/>.

²¹ See: Pat Mooney, cited in *Genetic Ownership: Brazil Wants Cut of Its Biological Bounty*, by Elizabeth Pennisi, *Science* 279, No 5356, Issue 6 March, 1998, p 1445; **and elsewhere**).

²² Personal communication, David Hathaway, 14 July, 1998.

The political legacy in Latin America of ruthless exploitation of natural resources leading to ecological destruction--and the systematic annihilation and marginalization of indigenous, traditional and local communities—have left countries unprepared to deal with economic and political issues raised by global biodiversity developments. Although Nation/States have acted to declare sovereign rights over flora, fauna, and appropriate technologies for sustainable development and biodiversity conservation, legal structures and political institutions are inadequate or non-existent to protect, monitor, or control access and transfer.

Some recent efforts by Brazil and the Andean Pact to establish regimes that control access and protect traditional resources are fundamentally radical in that they recognize the collective and community-based nature of *in situ* biodiversity conservation--which implies recognition of indigenous land, territorial, and resource rights. These rights are sometimes subsumed under the rubric of *self-determination*, historically seen by Latin American countries as a threat to their national sovereignty. However, with the rampant loss of genetic resources and traditional knowledge through biodiversity prospecting--by national, international, and multinational interests—Nation/States may have to forge equitable partnerships with indigenous peoples in order to attain local access to knowledge, flora and fauna.

The growing political awareness and effective international organization of indigenous groups--combined with the ethical, moral and legal concerns of scientists co-opted by commercial concerns--means that actions to develop principles and guidelines for access, transfer and benefit-sharing will no longer await government paralysis. By the time Latin Amazonian governments actually do act to protect traditional resources, they may find their sovereign rights undermined by research moratoria, private corporations, government entrepreneurs, and extensive data banks of “national patrimony” being beamed around the planet on the Internet.

It is unclear how biodiversity and biotechnology will influence economic development in Amazonia--but it is certain that “business as usual” will only lead to increased undermining of national sovereignty over traditional resources. The recent flurry of activities and *Projetos de Lei* may indicate dramatic changes in how Amazonian countries view their human and genetic resources, but it remains to be seen if the economic interests and public indignation of “biopiracy” translate into practical policies that improve the conditions of local, traditional, and indigenous peoples of Amazonia.

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