

Pathways to Economic Development Through  
Intellectual Property Rights

by

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The past decade has witnessed a growing amount of interest in the role which tropical forest plants and other genetic materials can play in the economic development of Third World countries and local indigenous communities. On statistical grounds alone, there are compelling reasons for developing countries and indigenous peoples to take an interest in profiting from their plant genetic resources. Although tropical rainforests cover only 7 percent of the earth's surface, they contain more than half of the world's estimated 10 million plant and animal species. In Mexico, scientists have identified over 24,000 plant species, many of which have been discovered to have medicinal and other uses. In comparison, the United States which is much larger than Mexico, contains only 18,000 species and in all of Europe there are only 12,000 plant species. The U.S. National Cancer Institute is currently carrying out a research program to identify plants that contain chemicals which can fight cancer cells. To date 3,000 plants have been identified, 70 percent of which come from the world's rainforests. The value of

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<sup>1/</sup> The following essay was written for delivery at the First International Conference on the Cultural and Intellectual Property Rights of Indigenous Peoples, held in Wakatane, New Zealand, on June 12-18, 1993. The views expressed in the essay are solely those of the author and should not be attributed to the World Bank, its Executive Directors or its Member Countries.

these plant-based medicines is growing, and numerous well-known pharmaceutical companies are involved in natural plant collection and screening.<sup>2/</sup>

According to the Washington-based World Resources Institute, "biodiversity prospecting" has become the new growth industry of the last decade of the 20th century. Sales of plant-derived medicines in the United States totalled \$15.5 billion in 1990; and in Europe, Japan, Australia, Canada and the United States, the annual market value for prescription and over-the-counter drugs derived from plants was estimated at \$43 billion in 1985.<sup>3/</sup>

Ethnobotanists have long recognized the role that the traditional plant knowledge of indigenous peoples has played in the growth of the modern pharmaceutical industry. Drugs such as quinine for malaria treatment, curare as a muscle-relaxant, the steroid hormone diosgenin that was used in the first contraceptive pills, and vincristine which is derived from the rosy periwinkle plant and serves as a cure for Hodgkin's disease

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<sup>2/</sup> See, Chris Bird, "Medicines from the Rainforest," New Scientist, 17 August 1991, pp. 34-39. The information on the number of plant species in Mexico was provided by biologist Mario Ramos of the World Bank. United States and European data are from Jack Kloppenburg, Jr., "No Hunting! Biodiversity, Indigenous Rights and Scientific Poaching," Cultural Survival Quarterly, Volume 15, No. 3, 1991, pp. 14-18.

<sup>3/</sup> Walter V. Reid, et. al., Biodiversity Prospecting: Using Genetic Resources for Sustainable Development, Washington, World Resources Institute, 1993. The data on the market for plant-derived pharmaceuticals come from Peter P. Principe, "The Economic Significance of Plants and their Constituents as Drugs," in H. Wagner, H. Hikino, and N. R. Farnsworth (eds.), Economic and Medicinal Plant Research, Volume 3; Academic Press, London, 1989, pp. 1-17.

and juvenile leukemia all originated from tropical plants which were known to traditional forest dwellers and healers.<sup>4/</sup>

Recently, a small biotechnology firm named Shaman Pharmaceutical Inc., has been established in California, the purpose of which is to search the world's tropical forests for tribal remedies, and to share some of its profits with its indigenous suppliers. Stephen R. King, Shaman's vice president of ethnobotany and conservation, is quoted as saying that "The real issue in the conservation of the rainforests is poverty. The people there need alternatives to expanding agriculture into the rainforests." Shaman has been compensating the traditional healers and indigenous communities who provide it with medicinal plants by paying them collecting fees and royalties from any drugs which are successfully developed. Similar arrangements have been made by Merck and Co., Inc. with a Costa Rican biological research organization called INBio and local rural communities whose members serve as plant collectors and taxonomists.<sup>5/</sup>

Obviously, a key issue is whether the intellectual property rights of developing countries and indigenous communities will be

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<sup>4/</sup> See, Elaine Elisabetsky, "Folklore, Tradition or Know-How?," Cultural Survival Quarterly, Vol. 15, No. 3, 1991, pp. 9-13.

<sup>5/</sup> The quote of Stephen R. King is from "Seeking Cures in the Jungle," Insight, October 7, 1991, p. 30. See, also his article "The Source of Our Cures," in Cultural Survival Quarterly, Volume 15, No. 3, 1991, pp. 19-22; and, the articles on Costa Rica's National Biodiversity Institute (INBio) in Walter V. Reid, et. al., Biodiversity Prospecting, pp.53-67, and 69-97.

recognized and respected in this global search for plant knowledge and genetic materials. Pharmaceutical companies and industrial countries argue that natural plants are the common property of humanity and the patent and other rights which arise from medicinal plant research are held by the discovering institutions. Developing countries have recently contested this position and been successful in gaining at least limited international recognition of their rights to plant genetic materials. Perhaps, the best evidence of this is the new International Convention on Biodiversity, which contains several articles protecting the property rights of developing countries to plants and other valuable species.<sup>6/</sup>

*Indigenous people already knew the plants use long before someone discovered it!!*

But, what about the intellectual property rights of traditional healers and indigenous peoples? To date, there is no international legal instrument which specifically protects the intellectual property rights of indigenous peoples, although the UN Working Group on Indigenous Populations has recently launched a study of the subject and its draft Declaration on the Rights of Indigenous Peoples contains an article protecting their intellectual property rights. "Indigenous peoples," Article 19 of the Draft Declaration reads, "have the right to special measures for protection, as intellectual property, of their

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<sup>6/</sup> See, John H. Barton and Eric Christensen, "Diversity Compensation Systems: Ways to Compensate Developing Nations for Providing Genetic Materials," in Jack R. Kloppenburg, Jr. (ed.), Seeds and Sovereignty, Durham, N.C., Duke University Press, 1988, pp. 339-355. Also, in the same volume, Rodger A. Sedjo, "Property Rights and the Protection of Plant Genetic Resources," pp. 293-314.

traditional cultural manifestations, such as literature, designs, visual and performing arts, seeds, genetic resources, medicine and knowledge of the useful properties of fauna and flora."<sup>7/</sup>

There are convincing ethical reasons for defending the rights of indigenous peoples to their intellectual property and other cultural manifestations. But will such recognition, if it does occur, necessarily lead to the economic development of indigenous communities?<sup>8/</sup>

My experience in Latin America indicates that the struggle for the recognition of intellectual property rights, especially over medicinal plants and other genetic materials, while important, is only one among many challenges which indigenous peoples face in the preservation of their cultures and the development of their communities. In the remainder of this essay, I would like to discuss some of these challenges, but before doing so let me briefly indicate why I am somewhat skeptical about the recent claims that the new bio-technology revolution and the recognition of intellectual property rights

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<sup>7/</sup> See, Darrell A. Posey, "Intellectual Property Rights for Indigenous Peoples: Challenges to Science, Business and International Law," Paper prepared for the President's Symposium of the Society for Applied Anthropology, York, England, April 1990. Also, the concise report by the UN Working Group on Indigenous Peoples, Intellectual Property of Indigenous Peoples, presented to the UN Commission on Human Rights, Sub-Commission on Prevention of Discrimination and Protection of Minorities, 6 July 1992.

<sup>8/</sup> One of the few books on the general topic is Robert M. Sherwood, Intellectual Property and Economic Development, Boulder, Westview Press, 1990. However, the book does not mention indigenous peoples and has only scattered references to plant genetic and pharmaceutical research.

will necessarily lead to the economic prosperity of indigenous peoples and other traditional rural communities.

Much of my thinking on this issue has come from experience with Brazilian Indian tribes, many of whom are recognized as possessing vast knowledge of tropical forest plants and ecology. One of the most isolated and culturally intact of these tribes is the Yanomami Indians who inhabit the large border region between Venezuela and Brazil. The Brazilian Yanomami (who are also referred to as the Yanoama, Shiriana, Xiriana, Guaharinbo, and Waika) are estimated to number around 12,000 people and live in hundreds of small villages in the states of Roraima and Amazonas. Yanomami men are great hunters and warriors and are known for their highly ritualized chest-pounding duels and intervillage feuds. Yanomami women are expert gardeners and cultivate magical charms many of which are powerful in warding off the violence and aggression of their men. The real center of Yanomami society revolves around its shamans or xaboris, who possess knowledge of an hallucinogenic drug called yakoana (or ebene among the neighboring Venezuelan section of the tribe). This drug is extracted from the resin of a tree (virola elongata) and when inhaled fights off illness and other evil forces which have attacked the Yanomami and could potentially destroy the earth

and their society.<sup>2/</sup>

From what we know about the Yanomami, their plant knowledge cannot be separated from other aspects of their religious beliefs, culture and cosmology. The Yanomami believe in a Supreme Being called Omane, who has created the sky, the earth, all animal and plant life, and humanity. Omane lives below the earth and has the power to release evil spirits known as xawara who cause illness and sorcery. One of the roles of the Yanomami shaman is to ward off these evil spirits through the taking of hallucinogenic drugs. The smoke which is released during the shamanistic ceremonies is believed to travel to the sky and to ensure that the sky does not collapse and destroy the earth and all its human and animal inhabitants. Too much smoke, such as that caused by the burning of the Amazon rainforest, is believed by the Yanomami to have caused the present wave of disease (especially the lethal spread of malaria) and to reflect Omane's anger at humanity.

Clearly, for a people such as the Yanomami, plant knowledge represents more than "intellectual property," in the sense which this term is used in Western economics and jurisprudence. Plants were given to human beings not as "objects" or "commodities" to be exchanged for money in impersonal markets, but rather as

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<sup>2/</sup> The discussion of Yanomami plant knowledge, shamanism and cosmology which follows comes from an interview with Davi Yanomami by the French anthropologist Bruce Albert, reproduced in Portuguese in the pamphlet Yanomami: A Todos os Povos da Terra, Acao Pela Cidadania, Sao Paulo, 1990, pp. 9-14. See, also, Shelton H. Davis, "The Saga of the Yanomami," in Maryknoll Magazine, Volume 87, No. 4, 1993, pp. 32-37.

"gifts" to maintain the delicate balance of the universe. Knowledge about these plants results from years of training as a shaman or spiritual leader, and should not be lightly given away or taken from others. These plants are revered as having sacred qualities, and they should be protected and kept secret. If not, the spiritual, social and ecological order upon which human existence is based will end in chaos and disorder. The current international discussion of biodiversity prospecting and intellectual property rights fails to comprehend this sacred or spiritual quality of indigenous plant knowledge, because it is so rooted in material considerations and the economic thinking of the West.

My second example concerning indigenous plant knowledge comes from the Guajajara or Tenetehara Indians who live in the far eastern edge of the Brazilian Amazon in the state of Maranhao. The Guajajara, unlike the Yanomami, have had nearly 300 years of contact with outsiders, speak Portuguese, wear western clothes and live in a region which is surrounded by small farmers, large cattle ranches and expanding timber, charcoal and pig-iron manufacturing industries. Like many of their small farmer neighbors, the Guajajara produce rice which they sell in regional markets, and continue to practice traditional gardening and hunting. They also practice their traditional religious ceremonies which, despite years of culture contact, still provide



them with some degree of ethnic and cultural solidarity.<sup>10/</sup>

In the early 1980s, a Brazilian company called Vegetex began prospecting in the Guajajara territory for a plant called Pilocarpus jaborandi, the leaves of which contain an alkaloid which is used in the production of eye drops for the treatment of glaucoma. The jaborandi plant was known to the Guajajara, and Vegetex began to dispatch men to their communities in order to gather its leaves. Once the leaves were gathered, Vegetex transported them to its storage facilities in the regional town of Imperatriz, and then on to Sao Paulo, where they were purchased by Merck and Company and then sent to Germany for chemical processing. Brazil is reported to monopolize the world market for jaborandi and to earn over 25 million dollars annually from the export of the product.<sup>11/</sup>

In 1989, I briefly visited the Guajajara reserve of Arariboia, one of the major centers of jaborandi leaf collection. What I found was a group of people who had become totally dependent on commercial plant extraction to the detriment of other aspects of their local economy and the general social welfare and psychological well-being of their community. Apparently, Vegetex's agents had gone to Arariboia and promised

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<sup>10/</sup> For background on the Guajajara, see the classic work by Charles Wagley and Eduardo Galvao, The Tenetehara Indians: A Culture in Transition, New York, Columbia University Press, 1949. Also, the general study on Brazilian Indians by Darcy Ribeiro, Os Indios e a Civilizacao, Rio, Civilizacao Brasileira, 1970.

<sup>11/</sup> Figure cited in Povos Indigenas no Brasil, Sao Paulo, Centro Ecumenico de Documentacao e Informacao, 1990, p. 367.

its leaders a steady source of income and the building of roads, schools and clinics in exchange for the collecting of the jaborandi leaves. On the basis of these promises, a number of Indian youths and men agreed to go into the forests which surrounded their villages and gather the leaves. During several months each year, the Indian leaf collectors (or folheiros as they are called in Portuguese) would go into the forest, where they would live in primitive camps under the direction of the company's agents. The wages they received were based on the weight of the product they collected less the costs of the food and other supplies which the company gave them. From most accounts of people that I talked to, these payments were significantly less than the price received for the jaborandi leaves in Imperatriz by individual prospectors, and certainly less than that paid by Merck and Company in Sao Paulo.

About 600 men or one fifth of the Arariboia community were involved in leaf collection when I visited the reserve in 1989. Many of the wives and family members of the leaf collectors complained that their sons and husbands had given up commercial rice farming, household gardening and small livestock production in order to gather the plants. Furthermore, there was no sign in the community that the company had built any schools or clinics as promised.

The government Indian agent assigned to the reserve also complained that the company's men were armed, and often used violence and other forms of intimidation to keep the Indians in

the forests. On several occasions, he was forced to call in the federal police in order to maintain order and investigate charges of debt peonage and slavery. Furthermore, there was some evidence that the jaborandi plant was being rapidly exhausted and rumors that the company was thinking of abandoning the area to seek the plants in other parts of the Amazon.

The Guajajara case, while perhaps extreme, does reflect some of the issues which indigenous peoples face when they become too dependent on commercial plant extraction, frontier middlemen and multinational companies. Throughout the forest regions of Latin America, indigenous peoples are trapped in a system of regional economic exploitation, where their lands and resources are coveted by outsiders and they have little control over their economic well-being and destinies. Forest-dwelling Indians are also subject to serious human rights abuses and seldom have access to judicial remedies.<sup>12/</sup>

Fortunately, over the past two decades, Latin American indigenous peoples have been forming into regional, national and even hemispheric organizations to defend their lands, peoples and cultures. These indigenous organizations have taken their case for protection against human rights abuses and economic exploitation to international bodies, such as the UN and OAS

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<sup>12/</sup> See, Shelton H. Davis, Land Rights and Indigenous Peoples: The Role of the Inter-American Commission on Human Rights, Cambridge, Cultural Survival, 1988; and Amnesty International, The Americas: Human Rights Violations Against Indigenous Peoples, London, 1992.

Human Rights Commissions, and there are several new initiatives in the human rights field, such as the ILO Convention 169 Concerning Indigenous and Tribal Peoples in Independent Countries and the Draft Declaration on Indigenous Peoples Rights, which could provide a more solid legal basis for the defense of their human rights and the protection of their intellectual property and other resources.

But, even if these international instruments are accepted, indigenous peoples will still face numerous challenges in determining their own destinies. Some of these challenges are worth brief mention, because they provide a context for understanding how intellectual property rights, if recognized, might be incorporated into a broader program of indigenous cultural preservation and economic development.<sup>13/</sup>

① First, for indigenous or ethno-development to take place, indigenous peoples need to have effective control over their lands, forests, waters and other resources. In many parts of the developing world, national governments still do not recognize the rights of indigenous peoples to their ancestral lands and territories. Furthermore, even in those countries where such rights are recognized, there are no effective mechanisms for their defense and protection. In Brazil, for example, more than

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<sup>13/</sup> One of the earliest statements on the need for an indigenous form of economic development (what is termed "ethno-development") is the Declaration of San Jose. The declaration resulted from a conference sponsored by UNESCO and attended by a number of Latin American indigenous leaders and anthropologists in San Jose, Costa Rica in December 1981.

100 million hectares of land (or about one third of the forested land area of the Amazon) has been set aside by the government for indigenous peoples. Many of these lands, however, have been invaded by mineral prospectors, lumber companies, and cattle ranchers, or are subject to expropriation by state development and conservation agencies for large hydroelectric dams, national parks and forest reserves, and land settlement schemes. In other words, lands which are recognized by the government as being Indian are not under indigenous control, and hence there is little opportunity for instituting a truly indigenous form of development on indigenous reserves.<sup>14/</sup>

② Second, indigenous peoples need more effective control over the design and management of development programs on their lands. Throughout the Americas, special government agencies have been established for the protection and integration of indigenous peoples. Many of these agencies sponsor development projects, which are intended to improve the social, economic and health conditions of these peoples. Experience has demonstrated, however, that these government indigenist agencies or bureaus are ineffective in carrying out their stated objectives and tend to stifle, rather than promote, self-defined and managed forms of development.

Interestingly, in countries such as the United States

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<sup>14/</sup> See, the English translation of the recent report by the Centro Ecumenico de Documentacao e Informacao, "Green Gold" on Indian Land: Logging Company Activities on Indigenous Land in the Brazilian Amazon, Sao Paulo, March 1993.

where, after decades of failure, formerly government-controlled programs have been transferred to tribal governments, there are now several success stories in the delivery of health, education, housing and other social services. There are also the first positive signs of the economic revitalization of Indian reservations and communities.<sup>15/</sup>

A number of international agencies have also come to see the importance of indigenous-controlled development programs. ILO Convention 169, for example, states that:

The peoples concerned shall have the right to decide their own priorities for the process of development as it affects their lives, beliefs, institutions and spiritual well-being and the lands they occupy or otherwise use, and to exercise control, to the extent possible, over their own economic, social and cultural development. In addition, they shall participate in the formulation, implementation and evaluation of plans and programmes for national and regional development which may affect them directly.<sup>16/</sup>

The World Bank has also introduced guidelines for the protection of indigenous peoples rights and their informed

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<sup>15/</sup> See, the interesting discussion of these trends on US Indian reservations in Stephen Cornell and Joseph P. Kalt, Reloading the Dice: Improving the Chances for Economic Development on American Indians Reservations, Cambridge, Harvard Project on American Indian Economic Development, John F. Kennedy School of Government, Harvard University, March 1992.

<sup>16/</sup> Article 7 of ILO Convention 169. Article 22 of the UN Draft Declaration on the Rights of Indigenous Peoples also provides for the right of indigenous peoples "to determine, plan and implement all health, housing and other social and economic development programmes affecting them, and as far as possible, to develop, plan and implement such programmes through their own institutions."

participation in the development process. These guidelines call for the conducting of pre-project Environmental Impact Assessments (EIAs) of all Bank-funded development projects which take place upon or affect indigenous lands. They also call for the formulation and financing of special Indigenous Development Plans, which should be prepared, managed and implemented by indigenous peoples themselves. In practice, however, the World Bank has found it extremely difficult to implement these guidelines. Many governments still resist the idea that indigenous peoples should determine their own development priorities and be provided with funds to directly manage their own programs and activities.<sup>17/</sup>

Third, even when indigenous peoples do obtain effective control over their ancestral lands and the internal decision-making processes within their communities, they face important decisions concerning the paths which they wish to follow in planning their economic development activities. One of the major decisions facing indigenous peoples is whether to maintain and reinforce their traditional economic livelihoods and lifestyles, or to develop or lease their resources for sale in regional, national and international markets. The tendency among economic planners is to stress the income benefits which indigenous peoples can obtain through entering into royalty agreements or

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<sup>17/</sup> See, Shelton H. Davis, "The World Bank and Indigenous Peoples," a paper prepared for a panel discussion on Indigenous Peoples and Ethnic Minorities at the Denver Initiative Conference on Human Rights, University of Denver Law School, Denver, Colorado, April 16-17, 1993.

other arrangements with outside companies. This position overlooks the important role which traditional livelihood or subsistence activities (hunting, fishing, gardening, wild plant gathering, etc.) continue to play in indigenous communities. It also often creates irreconcilable conflicts between industrial resource development activities and the desire of indigenous peoples to maintain and protect their traditional environments, social structures and spiritual values.<sup>18/</sup>

Fourth, in many countries indigenous peoples need training and technical assistance in order that they might regain control and management of their resources and the overall development process. These needs range from the desire to obtain simple numeracy and accounting skills to the learning of sophisticated management techniques and how to use new technologies, such as computers or satellite imagery for purposes of land demarcation and natural resource planning.

One of the most exciting things taking place in tropical forest regions of Latin America at present is the organization of various community-based forestry projects. Many of these projects have developed special technical assistance and training programs which combine modern forestry and natural resource management techniques with traditional indigenous technologies

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<sup>18/</sup> See, for example, the case studies from the United States, Canada and Latin America in Charles C. Geisler, et. al., Indian SIA: The Social Impact Assessment of Rapid Resource Development on Native Peoples, Ann Arbor, University of Michigan, Natural Resources Sociology Research Monograph No. 3, 1982.



and practices. There is also a growing tendency among Latin American indigenous organizations to exchange experiences within and across countries and to capitalize on the inherited wisdom of their elders in designing development training programs.<sup>19/</sup>

Lastly, there is little doubt that if indigenous peoples are to design and manage their own development projects, they will need access to credit and investment capital. In most countries, indigenous peoples are blocked from such access because of their poverty, the types of property they hold, and the discriminatory practices of conventional banks and credit institutions. Furthermore, many governments still refuse to transfer funds directly to indigenous communities and organizations, because of their fear that they will lose control over the development process.

However, there are some experiments taking place which hold promise of opening up new channels of credit and investment capital for indigenous development projects. One of these institutions is the new Latin American Indigenous Peoples Fund which was first announced at a summit meeting of Latin American presidents in Guadalajara, Mexico in July 1991. The Fund, which is supported by the Inter-American Development Bank and other international agencies, is intended to provide indigenous

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<sup>19/</sup> Several case studies of community-based forestry projects in Latin America which contain strong indigenous training and technical assistance programs are described in David Barton Bray and Dominique Irvine (eds.), "Resource and Sanctuary: Indigenous Peoples, Ancestral Rights, and the Forests of the Americas," Cultural Survival Quarterly, Volume 17, Number 1, 1993.

organizations and communities with: (a) concessionary credit for income-generating projects; (b) technical assistance for strengthening indigenous organizations; and, (c) grants for projects that advance reform in development conditions, that support nonprofit long-term investments, and that alleviate threats to the survival of indigenous peoples.

A unique aspect of the Fund is its decision-making and governance structure. Rather than a forum where governments or development experts tell indigenous peoples what programs and projects are good for them, the Fund creates a tripartite structure comprised of representatives of governments, indigenous organizations and international agencies who together will decide upon the direction of the Fund and the activities that it financed.

"The Indigenous Peoples Fund," a document released at its inauguration states, "ensures the direct participation of beneficiaries--indigenous peoples--in all decision making bodies of the Fund. The General Assembly and the Board of Directors will have equal representation of governments and indigenous peoples of each regional state as well as representatives of extraregional governments, thus ensuring the tripartite nature of the Fund."<sup>20/</sup>

In summary, the Latin American experience indicates that while indigenous intellectual property rights must be legally

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<sup>20/</sup> See, Shelton H. Davis, "Latin America's New Indigenous Peoples Fund," Akwe:kon Journal, Volume 9, No. 2, 1992, pp.44 and 45.

recognized and protected for purposes of maintaining the cultural integrity of indigenous communities, they will not necessarily lead to indigenous economic development and prosperity. To the contrary, the development challenges which indigenous peoples face go far beyond the issue of intellectual property rights or the promises of the advocates of the so-called "biodiversity prospecting" revolution. These include, as mentioned, the need for indigenous peoples to gain effective control over their lands and resources, the need to control the development decision-making and planning processes within their communities, the need to balance subsistence lifestyles with demands for rapid resource development, the need for culturally-appropriate technical assistance and training programs, and the need for direct access to credit and investment capital. Perhaps, some indigenous groups may choose to lease or sale their knowledge of medicinal plants and other genetic materials to outside companies, but this should not be looked upon as a panacea for the hard choices which indigenous peoples need to make in determining their own development paths.