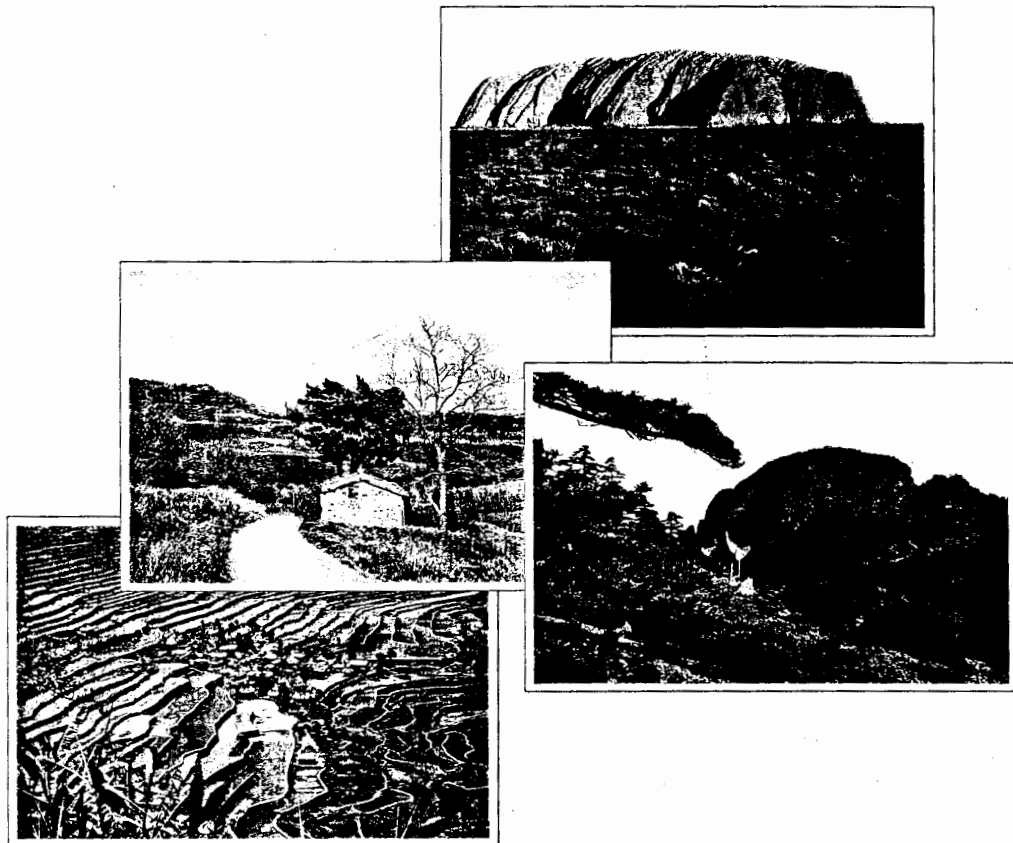


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Cultural Landscapes of Universal Value



 **GUSTAV
FISCHER**



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With contributions of
42 scientists

Cultural Landscapes of Universal Value

-Components of a
Global Strategy-

87 Figures, 16 Boxes and
5 Tables



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Chapter 3

The Interaction between Biological and Cultural Diversity

Jeffrey A. McNeely and William S. Keeton

“Variety is the spice of life” takes on new meaning in a time when consumers in Bangkok, Bogota, Bangui, Boston, Brisbane and Belfast are eating the same Big Macs, drinking the same Pepsi, watching the same Bill Cosby programme, smoking the same Marlboros, and wearing the same Levis jeans. Does the global consumer culture mean the death of the world’s rich diversity of peoples and cultural traditions? If so, what are we losing? And what does the loss of cultural diversity mean to the natural environment?

Introduction

Throughout history, local societies have ebbed and flowed as their wisdom was tested against the criterion of sustainability. Those societies that were able to develop the wisdom, technology, and knowledge to live within the limits of their environments were able to survive. Others over-exploited their resources, so they flourished only briefly, giving up sustainability and adaptability for a flash-in-the-pan flush of immediate wealth.

Over the past several generations, the highly diverse and often localized adaptations to local environmental conditions have been replaced in most places by a world culture increasingly characterized by very high levels of material consumption, at least for a privileged minority. Economic growth based on the use of fossil fuels as an energy source, greatly expanded international trade, and improved public health measures have spurred such a rapid expansion of human numbers and consumption that new approaches to resource exploitation have been required.

These approaches, often involving powerful machinery, sophisticated technology, and arcane economic instruments, have overwhelmed the conservation measures that local communities have developed from long experience. Cultural controls on over-exploitation, such as self-imposed restrictions on hunting certain species of animals or females during calving seasons, ownership of grazing rights and forest resources, rotation of hunting zones, taboos on hunting certain species, limitations on forest clearance, and protection of special groves of trees for religious reasons, often have not been able to stand up to the seductions of the market economy, especially when harvesting rights are given to outsiders by governments who disregard traditional land rights.

In Colombia, the forests of the north-west Amazon basin harbour a bewildering array of plants and animals. This region is often considered part of the world’s greatest remaining tropical wilderness. But for the Tukano people who live there, it is not a wilderness, it is

home, and they have developed a detailed knowledge about how to wrest a living from this seemingly inhospitable environment. The Tukano perceive their "wilderness" environment to be man-made, transformed and structured in the past by the symbolic meaning their ancestors gave to resources and the knowledge they obtained of plants and animals that enabled people to survive. Their forest is a system of resources in which the energy produced is directly proportional to the amount of energy it receives. They know that they cannot harvest more than the forest can produce, and they call on a sophisticated knowledge of individual species and their uses. Their long tradition of constant observation of animal behaviour, acquired as part of their daily struggle to survive, provides guidance on what adaptations are possible. Their myths tell of animal species that were punished by the spirits for indulging in gluttony, boastfulness, improvidence, and aggressiveness. These myths serve as examples to human society, in which animals are metaphors for survival. By analyzing animal behaviour, the Tukano find an order in the physical world within which human activities can be adjusted (Reichel-Dolmatoff 1976).

The Tukano relationship with wildlife is typical of people whose welfare depends on how they manage resources. Like many indigenous peoples, they limit their own harvests, guided by a thorough knowledge of population levels and ecological relationships and restrained by their traditional code of ethics. Such people walk lightly on the landscape, with such success that outsiders often consider their habitats to be a "wilderness," as if no people had ever lived there.

Today, both biological diversity and cultural diversity are being depleted, posing a very real threat to humanity, which can exist in the long term only through a sustainable and interwoven relationship between nature and culture. Unfortunately, western and other civilizations have long viewed nature and culture as distinctly different subjects. Perhaps this separation is one of the root causes of our current environmental problems. An appreciation of traditional knowledge could help bring these two elements back together. Throughout the world, resources historically have been managed by diverse human societies via cultural mechanisms that give social and symbolic value to land and resources beyond their immediate extractive value. These symbolic relationships were based on ecological principles that support a system of social and economic rules that have a highly adaptive value in the ongoing struggle to maintain a viable equilibrium between natural resources and the demands of society. The traditional symbolic values have helped enable societies to avoid overexploitation and to live within the limits imposed by the availability of resources. Today's dominant symbol is money, and it is replacing natural symbols of proven worth to so-called "primitive" peoples.

In his 1992 book, *Millennium: Tribal Wisdom and the Modern World*, anthropologist David Maybury-Lewis pointed out that as the end of the century draws near, the modern world is marked by unprecedented degrees of confusion, insecurity, and yearning for change. Industrial society is losing self-confidence in the face of the future, and indeed the future itself has been brought into question. Under such conditions, the value of tribal wisdom can be fully appreciated, bringing an opportunity to consider new models for living in balance with our resources. A return to tribal or "primitive" lifestyles is not a realistic answer for the industrialized world or a feasible option for most of the world's 5.5 billion people, or for the projected doubled world population of the next century. Rather, new and sustainable systems of resource use can incorporate the traditional knowledge and wisdom of indigenous peoples. Indeed, the modern world may need traditional wisdom more than tribal peoples need the modern world.

Cultural Diversity: What is it, how did it originate and why is it important?

Cultural diversity is the measure of the variety of human life. It is reflected in language, material culture, belief, knowledge, myth, and religion. This diversity enables people to adapt to the extremely diverse natural habitats that cover our planet. Indeed, the diversity of cultures may have been stimulated by the need for people to adapt to local environmental conditions, superimposed on historical events. Cultural diversity is now threatened by the new global consumer culture, which is spreading through television, trade, and other means. The loss of cultural diversity means that people are less well adapted to specific local conditions, though they may be able to contribute better to the global economy. But the future is uncertain, and the global consumer culture has not stood the test of time.

The history of the human species is a saga of wave after wave of peoples pursuing or supplanting those who went before them, expropriating their lands and pushing previously settled peoples into areas unwanted or unobtainable by their successors. Thus the global distribution of ethnic groups is a patchwork or overlay of people on people. The term "indigenous" is therefore a rather arbitrary division of a continuum or sequence of transitional human populations. The history of this continuum, however, can be seen as a chronicle of the differentiation of peoples into distinct ethnic or cultural groups. This pattern of differentiation – geographic, behavioral, linguistic, and biological – has created the cultural diversity we know today. Much of this cultural evolution has also been affected by environmental constraints that produced adaptations – behavioral, ethical, and religious – that enabled groups of people to survive in harsh conditions and out-compete their rivals. Cultural evolution in response to environmental pressures has produced a vast body of indigenous knowledge and traditions relating to the natural world, including myriad interpretations – mythological, ethical, religious and philosophical – of the relationship between humans and nature.

The United Nations International Labour Organization's Convention on Indigenous and Tribal Peoples (1989) defines indigenous peoples as "a) tribal peoples in independent countries whose social, cultural and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations; and b) peoples in independent countries who are regarded as indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions...Self-identification as indigenous or tribal shall be regarded as a fundamental criterion for determining the groups to which the provisions of this convention apply."

According to the United Nations Commission on Human Rights, about 300 million people can be considered to be indigenous under the Convention's definition, spread among 70 countries around the world. China and India together account for almost half of the world's total indigenous population. At least 5,000 indigenous groups can be distinguished based on linguistic and cultural differences and geographic separation. At the request of indigenous organizations, the United Nations General Assembly proclaimed 1993 to be the "International Year for the World's Indigenous People, to strengthen international

cooperation for the solution of the problems faced by indigenous communities in areas such as human rights, the environment, development, education and health.”

A major effect of economic development has been to tie as many of the world's peoples as possible into the global economy. People in even the most remote areas are expected to produce more for distant markets, and to open up their territories for tourism. Many of them welcome the material goods which result, but the cost is often loss of control of their own resources, and a loss of both biological and cultural diversity.

Traditional relationships between indigenous cultures and the natural world

Being forced to live within the limits of their local ecosystems has encouraged people to develop sophisticated knowledge about resource management. Indigenous people have sometimes over-exploited their resources, leading to the extinction of cultures (such as the Anasazi of Arizona), as well as extinction of species (e.g. moas and mammoths) and large scale ecological degradation (e.g. salinization of irrigated fields in the Tigris/Euphrates watershed under the Mesopotamian empire). In other cases, indigenous people have significantly altered, though not necessarily degraded, the character of ecosystems (e.g. Native American alteration of forest composition, alteration of tropical forests by indigenous peoples, burning of African woodland to create savannas, and alteration of Australian vegetation under Aboriginal fire regimes). This demonstrates that, in many cases, what we think of as “wilderness” owes much of its character to habitation by indigenous peoples. Thus many indigenous peoples have functioned traditionally as an integral part of ecosystems, rather than as separate entities. This indicates that when humans do not out-strip ecological constraints, they can co-exist sustainably with ecosystems. Moreover, humans should never be thought of as somehow living outside of ecosystems, since humans are, in fact, very much a part the environment.

Indigenous peoples have adapted their uses of biological resources to environmental constraints in numerous ways. For example, traditional methods which have helped indigenous groups respond to game depletion include controlling tribal population size; relocating settlements; maintaining small settlements disbursed as widely as possible; trekking to distant hunting areas; increasing the proportion of time spent in undisturbed areas far from the settlement yet near enough to allow travel within a few days; expanding the breadth of game taken (especially the smaller species); and refraining from hunting threatened species (Balee 1985).

The Dai people, an indigenous ethnic group inhabiting Xishuangbanna in the mountainous tropical region of southwest China, have a long tradition of conservation practices. The Dai' traditionally maintain “Holy Hills” and Buddhist temple-yards which are specifically managed for the conservation of biodiversity (species and habitats) through formal or informal norms and rules stemming from their ethical and religious beliefs (Pei Shingji 1991). Holy Hills, a belief derived from an earlier and formerly more dominant polytheistic religious tradition, have helped to preserve areas of diverse vegetation. The Dai people also have had other profound effects on the ecology of their domain. For instance, the introduction and current distribution of many locally cultivated plants in Xishuangbanna is historically related to spread and acceptance of Hinayana Buddhism within the last 1400 years. According to Pei Shingji (1985), “in addition, the

Dai practice of cultivating fuelwood also contributes to the conservation of natural forests and is of economic and ecological significance to human adaptation in humid tropical environments.”

The Koyukon Indians of Northern Canada have an elaborate code of respectful behaviour that governs their relationship toward animal species. For example, red squirrel meat should not be cooked on a stick, women must never mention the brown bear's name, beaver bones should be returned to the water, hunters must avoid bragging about prowess, and numerous other such specific rules. They limit their own harvests, guided by a thorough knowledge of population levels and ecological relationships, restrained by their traditional code of ethics (Nelson 1989).

Posey (1982), who spent many years working among the Kayapo Indians of Amazonia, found that while routinely scavenging through the forest, the Indians gathered dozens of plants, carried them back to the forest campsites or trails, and replanted them in natural forest clearings. Such plants included several types of tubers, beans, and other food plants. Such “forest fields” are always located near streams, but even in the savanna, where patches of forest are scattered, areas where collected plants have been replanted form useful food depots for the indians. This age-old pattern has had profound effects on the distribution of plants in the forest and has been an essential contributor to the current biodiversity of Amazonia. Posey found that a Kayapo indian would find it natural to replant, near where he defecated, a portion of the roots, seeds, and cuttings which he had collected. Thus, plant nurturing is very much a part of the Kayapo relationship with nature. In addition, certain game species do not occur in forest unmodified by humans, and important game species of mammals such as deer, tapir, and collared peccary reach much higher densities in modified areas.

Given the human proclivity to deplete natural resources, healthy and energetic societies must develop a set of highly adaptive behavioral rules for survival supported by a coherent belief system with a foundation of deeply motivating values which make endurable the challenges of existence in an unpredictable world. Studies by Reichel-Dolmatoff (1976) found that many primitive aboriginal tribes have a rich body of folklore and myth – often with rituals to match – that provide a social and economic framework which allow tribes to adapt their lifestyles to achieve a balance between their needs and those of the world around them.

The Koyukon Indians of northern Canada, for example, believe that future events will depend on the way people behave today and that the world can be nurtured by prudent use or harmed by unrestrained abuse. But equally important, the natural world will respond to gestures of respect given by those who recognize its sensitivity and awareness, and humble themselves to its power (Nelson 1989). Oren Lyons, a spokesman for the Traditional Elders Circle of the Onondaga Nation in North America, has questioned the values that modern destructive societies are teaching their children. “But from where we come from”, he says, “the natural law is simple in this case: we will suffer in exact ratio to our transgressions and the damage done may be permanent to life as we know it today” (Lyons 1990).

Forces driving the loss of cultural diversity

Land use management throughout much of Sub-Saharan Africa has been evolving from a communal land system to more formal and individualistic land title systems. Most

traditional communities do not have effective title or control of their land systems, or any effective way to make their views felt at the national policy level. The colonial period was marked by a taking of many of the most desirable lands from long-term resident communities. The post colonial period of nationhood has further served to provide legal vehicles for a taking of land and resources from local communities in the national interest. Added to this are population pressures on the land, contributing to a breakdown of traditional methods of control.

For the Shona of Zimbabwe this scenario of divestiture of land has been all too evident. Traditionally, the Shona managed their lands communally, based on ancestral relationships. Sacred sites and sites of historical importance traditionally were preserved throughout the Shona domain, though outsiders were generally unaware of these areas or of the values attached to them. Consequently, the breakup of Shona lands into small parcels under individualistic ownership schemes failed to maintain traditional land use protection and management systems, and resulted in a loss of cultural heritage and associated sustainable farming practices (IUCN 1993).

The Tuaregs of West Africa are nomadic pastoralists. During the brief West African rainy season, the Tuaregs move their herds of camels and other livestock such as sheep and goats into the desert to take advantage of the ephemeral seasonal grasses. As the dry season returns, the Tuaregs withdraw their herds back to more permanent grazing areas close to water sources. This continuous cycle of movement allows the vegetation to regenerate and replenish itself. Tenuous water sources are also allowed to replenish themselves. The Tuareg rely on their livestock for transport, milk, and occasionally for cash if an animal is sold. Like many pastoralists, the Tuareg also rely on their livestock's manure for cooking and heating fuel (Burger 1990). The French colonization of the region in the early 20th century profoundly changed the Tuareg economy. Raiding, a traditional component of Tuareg culture, was suppressed and the trans-Saharan caravan trade declined in the face of modern transport methods. The imposition of political boundaries, customs duties, and other governmental restrictions caused many Tuareg to abandon their nomadic lifestyle and settle permanently, despite their deeply rooted dislike of agriculture. In their new agricultural lifestyle, the Tuaregs have become more susceptible to drought, such as the major drought of the early 1970s that drove thousands of Tuaregs into Niger and Nigeria (Gaisford 1981).

The Lapps (or Saami) of northern Scandinavia are a distinct ethnic group who migrated to the region from Russia perhaps 10,000 years ago (Gaisford 1981). The majority, around 20,000, live in Norway, with 10,000 in Finland, 3,000 in Sweden, and perhaps 2,000 in Russia. Lapp culture was traditionally decentralized, with families organized into loose associations. This has created tensions with central Scandinavian governments who have sought to establish political control over the Lapps. Lapps live in permanent settlements in the northern tundra, although some live to the south in the coniferous forests, and many live along the coast. Today, only about 10 percent of Lapps are still engaged in the traditional occupation of reindeer herding. For most Lapps, reindeer husbandry is no longer economically viable (Rogers 1993). Many Lapps also continue to practice traditional fishing, trapping and farming. Most Lapps have become thoroughly assimilated within the national Nordic cultures, but the Lapps continue to possess a strong ethnic identity and determination to preserve their culture (Rogers. 1993). Since much of their language and culture is closely linked with their nomadic past, this has proved difficult. Lapps today face the dilemma of trying to find a means of economic survival that will

enable them to preserve their culture without forcing them to live on reservations or become tourist attractions.

Even well-meaning efforts can lead to the loss of cultural elements. The Oroqen people once occupied a large area south of the Outer Hinggan Range and north of the Wutsuli River in the northeast of China. A Czarist Russian invasion in the mid-17th century, and later occupation by the Japanese in the 1930s and 40s, drove these nomadic hunters into the northern areas of Heilongjiang Province and the southern forests of the Greater Hinggan Mountains. Disease and poor living conditions reduced Oroqen numbers to only about 1000 individuals. According to He Chongyun (1988), work teams and other assistance were provided to the Oroqen following the founding of the People's Republic of China in 1949. After consultation with Oroqen representatives, a site was chosen for the establishment of new Oroqen community. Today this village is known as "the 18th Station", and is the first "hunters' village" in Heilongjiang's Tahe county. In 1985 the community's wooden houses were replaced by brick structures. Other facilities such as schools, medical clinics, a cultural centre and a broadcasting station have also been built for the Oroqen. The Oroqen have increased to around 4,000 individuals and now live in several communities. While the inhabitants of these communities are now predominately farmers, many still maintain pride in their nomadic past and practice traditional hunting skills. Their shamanist religion continues to instill a deep connection with nature and animal symbols, such that ritualistic hunting of certain species (such as bears) remains a central part of their culture. The Chinese consider the Oroqen assistance program to be largely a success, though it is clear that many aspects of the Oroqen culture have been lost as a result of the change from a nomadic lifestyle to a settled, agricultural lifestyle.

Baines (1991) has written about the efforts of indigenous peoples in the South Pacific to nurture economic development while maintaining control over resource management. In the Solomon islands of the South Pacific the last 20 years have witnessed growing conflict between development interests and traditional land/sea tenure systems. Governmental agencies have grown increasingly frustrated with legislative provisions that safeguard the rights of indigenous peoples to maintain control over their lands and coastal areas. Pressure is mounting to introduce legislation to override customary tenure and associated rights. This would give the government access to large areas that could be opened for mining, logging, tourist development, and other forms of development. To a large extent this movement has been promoted by some Pacific islanders who perceive their ancestral systems as impediments to a "progress" they believe only "western" forms of development can provide.

The "Noble Savage": Myth or reality?

Traditional peoples, however, are not instinctive paragons of ecological virtue. Indeed, many traditional societies have been characterized by high levels of aggression toward their neighbours, and there are numerous examples of species hunted to extinction by technologically simple cultures. When the US Congress established "native corporations" to bring Alaskan natives into the economic mainstream in the 1980s, some forests in the rich southeast of the state were stripped bare of their timber, leaving devastation behind. When local people are part of a local ecosystem, their behaviour directly affects their own survival. But cultural mechanisms that have been developed as adaptations to the

environment over tens or hundreds of generations are quickly cast aside when trade frees people from traditional ecological constraints, changing them from what the distinguished ecologist Ray Dasmann calls "ecosystem people" into "biosphere people" who can draw from the resources of the entire world (Dasmann 1975).

These had been made a distinction between people who are "leavers" and those who are "takers." The former (like Dasmann's "ecosystem people") are those who live with close "feedback loops" between the way they manage resources and the costs and benefits they receive, leading them to leave resources for future use. The latter (like Dasmann's "biosphere people") are those who consume resources without recognizing the impact of such consumption on local ecosystems; they live within feedback loops so large that individuals do not feel personally responsible for resource use decisions. Indigenous people have small feedback loops, and directly manage the resources upon which they depend.

As Redford (1990) said, "to live and die with the land is to know its rules. When there is no hospital at the other end of the telephone and no grocery store at the end of the street, when there is no bi-weekly paycheck nor microwave oven, when there is nothing to fall back on but nature itself, then a society must discover the secrets of the plants and animals. Thus indigenous peoples process extensive and intensive knowledge of the natural world. In every place where humans have existed, people have received this knowledge from their elders and taught it to their children, along with what has been newly acquired."

The idea of the "noble savage" originated with Jean-Jacques Rousseau's and Thomas More's idealization of "primitive peoples" as innocent of sin and manifestations of goodness and nobility. Anthropologists have shown that indigenous groups often process culturally encoded mores that result in preservation of the resource base. But these documented patterns are sustainable only under conditions of low population density, abundant land, and limited involvement with a market economy. How relevant are such methods and customs to situations where these three conditions no longer exist? Techniques developed to satisfy subsistence needs are unlikely to work when surpluses are needed for cash. To believe that when confronted with market pressures, higher population densities, and increased opportunities, most indigenous peoples will maintain the integrity of their traditional methods is not only to argue against the available evidence, but worse, to fall into the ideological trap that produced the ecologically noble savage (Redford 1990).

Conclusion

Some innovative ways to link culture and conservation are being tested in various parts of the world. The Wasur National Park, in Indonesia's Irian Jaya province near the border with Papua New Guinea, for example, is a savanna habitat which has been managed by people for generations. All areas of the park have strong mythological, spiritual and dietary links to the people. These beliefs will continue to help support the protection of the sanctuary zone as long as cultural protection remains a major consideration and access for certain Marind people continues to be allowed. One area in the sanctuary zone is considered the centre of origin of the Marind tribe. Other areas, called *dusun*, are traditional gardening, hunting or sacred sites, usually owned by the clans or families to whom they were originally assigned in tribal mythology. A number of *dusun* are sprinkled

throughout the park. As part of the management of the national park, people who traditionally own *dusun* may have continued access and carry out traditional management practices. The people residing in the 13 villages within the national park may remain there. Traditional hunting (especially of deer) is allowed only for park residents (Craven 1992).

Siberut is the northernmost island in the Mentawai chain, located off the west coast of Sumatra in the Indonesian Archipelago. The Mentawais are home to a rich biological diversity of which 65 percent of the mammals are endemic, including four species of endemic primates. Only on Siberut, however, do expansive stands of tropical rainforest remain, although these too have been heavily logged during the last decade. Sharing the forests are indigenous people who live in ecological harmony with their forests. Only on Siberut does this indigenous Metawaiian culture remain largely intact. The indigenous Metawaiians are heavily dependent on harvesting primates for food, yet the harvest is conducted sustainably and primates remain abundant. As increasing development (e.g. logging) pressures began to affect Siberut in the 1970s, WWF and IUCN launched a programme to conserve Siberut's biological diversity and indigenous people. This programme has been successful in establishing protected areas (or nature reserves) that incorporate traditional, sustainable uses by indigenous peoples. In addition, the programme provides a system for conserving resources and biodiversity in those areas not officially declared as protected areas. Continuing work to implement the conservation program is being carried out under the auspices of the Asian Development Bank. The island has also been declared a Biosphere Reserve under UNESCO's Man and the Biosphere Programme.

Aboriginal land claims are recognized under Australian law in several states, particularly in the Northern Territory. As a result of this recognition, traditional uses are frequently incorporated into national park management. A number of national parks have been established which subsequently were returned to traditional owners, and in turn leased back for continued use as protected areas for conservation and recreation. Examples of such arrangements in the Northern Territory include Uluru National Park, Kakadu National Park and Nitmiluk National Park (see the chapter by Layton and Titchen in this volume). Leasing arrangements vary, but traditional owners usually receive some form of financial return. Traditional aboriginal owners maintain their rights to hunt, fish and gather plants, though these activities can be restricted if depletion of resources occurs. Aborigines are often employed as park rangers and labourers and (in some states) as consultants on such matters as fire management and cultural interpretation. Aborigines are also often employed in specific management projects such as rare or endangered species recovery. Traditional owners are also consulted as to major policies or decisions involving the park.

The Anangu aborigines of Australia have gained title to Uluru National Park. Since the agreement stipulated that the park would be leased back to the government, in practical terms title only ensured joint management of Uluru by the Anangu and the Australian National Park and Wildlife Service. However, sacred sites were granted full protection and access to the park for ceremonial purposes and aboriginal hunting was guaranteed. The joint management approach was designed to achieve two objectives: the mediation of conflicts over traditional uses of the park and the regulation of tourists. In addition, Anangu knowledge of local ecosystems and animal behaviour have played a central role in coordinating surveys of animal populations and in resource management decisions. However, the joint management plan has been criticized for employing a framework that

is completely non-aboriginal in form. While the framework has enabled Anangu to achieve significant gains in controlling their lands, it has not eliminated conflict over aboriginal and non-aboriginal uses of Uluru National Park (IUCN 1993).

In the Pacific, many islanders are growing increasingly resistant to development, and more concerned about traditional values. Debate over a barrage of development proposals (including agriculture, fishing, mineral prospecting, logging and tourism) for the Marovo Lagoon in the Western Solomons led to an alliance between the Marovo village council and the Western Province. Working together, the Marovo Lagoon Resource Management Project was established to provide villagers with greater input into development planning for the area (Baines 1991). Other Solomon Islands communities are taking similar action. Some communities have resisted logging by developing their own conservation organizations, which have been active in managing local, small-scale, silviculturally sound commercialization of forest timber. Villagers on the island of Vella Lavella, concerned about improving the management of their customary natural resources as their population is rapidly growing, have chosen the year 2000 as their deadline for becoming fully involved in resource management decisions (Baines 1991).

In New Zealand, the Resource Management Act of 1991 introduced into law a system for the sustainable management of natural resources. The system also embodied a set of specific safeguards for protecting and enhancing of the interests of the indigenous people of New Zealand, the Maori. While the Treaty of Waitangi signed in 1835 by European settlers and the Maori stipulated that the nation was to be owned, shared, managed and protected by both cultures, the Maori have been unable to gain political representation or have their concerns incorporated into legal statutes. The Act of 1991, therefore, presents a distinct departure from precedent. Under the new system, a range of consultation mechanisms have been established to involve the Maori in resource management decisions (IUCN 1993).

According to the IUCN (1993), the Dene of Northwestern Canada now co-manage their resources with the Canadian government. The Dene's formal co-management process was developed after negotiations on land claims with the government over several years. However, co-management is viewed by the Dene as only an incremental step in the right direction, with full management control their ultimate goal. The Dene's culture continues to deteriorate, with traditional knowledge and practices rapidly disappearing. This has led to a breakdown in traditional social structures and kinship systems, with a corresponding decrease in self-esteem, one manifestation of which has been an increase in suicide among the young. To help stem the loss of traditional Dene knowledge, a cooperative team was formed including local Dene and non-indigenous social and natural scientists to record traditional knowledge regarding resource management. It is hoped that the codification of traditional knowledge and its transmission to the younger generation will serve the dual purpose of maintaining interest in Dene culture while encouraging sustainable resource management practices.

The Inuit of Nunavik in Northern Quebec have developed a comprehensive information database to record their traditional knowledge of their lands and natural resources. The Inuit have a detailed knowledge of the biological characteristics of many species, as well as a comprehensive understanding of the marine, freshwater and terrestrial ecosystems of Northern Quebec. In a land claims settlement in 1975, the Inuit and Cree Indians of James Bay were granted lands, harvesting rights and participation in resource management and environmental protection regimes in exchange for their surrender of their claim of title to

a large area of Quebec. Begun 15 years ago, their information database now provides the foundation for sustainable management of their resources. The Inuit established the data collection system, manage it, and have full control over its uses. However, a joint research program has been set up between Inuit and non-Inuit researchers and resource managers. This program will integrate indigenous knowledge and modern science in a research and management process. The database has been used extensively by the Inuit in resource management and sustainable development decisions, including the development of small-scale commercial fisheries, tourism development, and environmental impact assessment (IUCN 1993).

The conflict between indigenous uses of wildlife and contemporary societal values attached to certain species is vividly illustrated by the current situation facing indigenous Greenlanders. In Greenland, the indigenous peoples have gained self-governance over their land and resources. Hence, the perennial issue of title and control of land is not the problem. Rather, some indigenous Greenland communities have experienced economic hardships because of the decline in demand in North America and Europe (with the exception of Denmark) for sealskins, one of Greenland's traditional export products. The indigenous Greenlanders argue in favour of increased sealing, based on assurances that seals would be harvested sustainably; sealing is locally regulated, certain protected areas are off limits for sealing, and sealing by non-residents is prohibited. However, while certain indigenous hunting communities may still be dependent on wild harvests, over 90 percent of Greenland's GNP now comes from the commercial fishery sector. Resolution of this issue thus depends largely on the willingness of foreign markets to sanction increased sustainable harvests of seals, or on finding alternative economic solutions (such as within the commercial fishery sector) for indigenous Greenlanders that will nevertheless preserve their cultural heritage (IUCN 1993).

Faced with rapidly diminishing living space as a result of deforestation and occupation of tribal lands by campesinos, some Amerindian groups have organized themselves to fight back. In El Salvador, some Indians have been campaigning, with partial success, for communal lands at the community level, working through the National Agrarian Reform Act (Chapin 1992). In Honduras, several federations have joined forces to work with MOPAW, a development organization, to secure title to tribal lands and forestall colonization of these areas. As part of this program, the Tawahka Sumu have been granted the Tawahka Biosphere Reserve. The Miskito in Nicaragua have formed an organization called Miskito Kupia (or "hear of the Miskito") to advocate an Indian-managed reserve encompassing the entire Miskito Cays area. Similarly, the Kekchi and Mopann Maya of Belize are campaigning for a homeland of some 200,000 hectares. "In Panama, the Kuna, the Embera and the Wounnaan have had some success in establishing tribal homelands as well. However, similar efforts in Panama by other, less politically organized tribes, such as the Guaymi and the Veraguas, have had little success due to conflicts with private and governmental economic interests in these tribal lands" (Chapin 1992).

Two international congresses of indigenous peoples have been held, in 1989 and 1991, to develop strategies for blocking colonization and unsustainable development, and to explore the connections between land rights and natural resource management.

In November 1981, Brazil's President Fernando Color de Melo issued a decree to give the Yanomani, the largest Indian group in the Amazon rainforest, partial control of their traditional lands. The decree came after apparent last-ditch efforts by the Brazilian military to prevent it, because the Yanomani lands, in the north of the Amazon Basin,

include the border with Venezuela – a militarily sensitive area. The Yanomani will gain control of their land after the Government has formally surveyed the forest and established the boundaries, at a cost of some US\$2 million. Mineral rights will rest with the Government. The decree comes as part of a zoning process which will involve dividing the forest into zones for protected areas, traditional Indian farming and hunting or for rubber tappers and others who use the forest without destroying it, and those areas where logging, roads, mines, dams and other ecologically destructive development can take place.

The tropical developing world holds the lion's share of the world's genetic diversity, as well as a vast body of indigenous knowledge of flora and fauna. The developed world, however, holds the technological capability in biochemistry, genetic engineering and biotechnology needed to develop genetic resources into commercial products. This disparity continues to generate controversy over whether genetic resources and traditional knowledge are part of the "global commons," or whether such resources are the exclusive heritage of their native regions. Under the Convention on Biological Diversity, which entered into force at the end of 1993, most countries now recognize the "sovereign right" of countries to control the utilization of their genetic resources and traditional knowledge. Pharmaceutical, biotechnology and agricultural companies in signatory nations must now reach cooperative agreements with countries from which genetic resources are to be obtained. Under this system, the potential exists for indigenous peoples to market their traditional knowledge. It is to be hoped that this will provide an incentive both for cultural preservation and sustainable utilization of natural resources that will allow biodiversity on tribal lands to be preserved. But the danger of further exploitation of both resources and people is never far from the surface.

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