



## Indigenous Knowledge System: Concepts and Discourses

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Sophisticated knowledge of the natural world is not confined to science. Human societies all across the globe have developed rich sets of experiences and explanations relating to the environments they live in. These 'other knowledge systems' are today often referred to as traditional ecological knowledge or indigenous or local knowledge. They encompass the sophisticated arrays of information, understandings and interpretations that guide human societies around the globe in their innumerable interactions with the natural milieu: in agriculture and animal husbandry; hunting, fishing and gathering; struggles against disease and injury; naming and explanation of natural phenomena; and strategies to cope with fluctuating environments. Indigenous knowledge is the local knowledge that is unique to a culture or society. Other names for it include: 'local knowledge', 'folk knowledge', 'people's knowledge', 'traditional wisdom' or 'traditional science'. This knowledge is passed from generation to generation, usually by word of mouth and cultural rituals, and has been the basis for agriculture, food preparation, health care, education, conservation and the wide range of other activities that sustain societies in many parts of the world. Indigenous people have a broad knowledge of how to live sustainably.

### The idea of indigenous knowledge

Although the manifestation of what is taken to be indigenous knowledge could presumably be traced back roughly to the origins of humankind, the idea of indigenous knowledge is a relatively recent phenomenon. It has arguably gained conceptual and discursive currency only during the last twenty-odd years. Especially in recent years it has been the subject of congresses, conferences, meetings, as well as countless papers, articles and reports. What, then, is 'indigenous knowledge'? What is the emphasis on indigenous knowledge meant to achieve? 'Indigenous knowledge' is generally taken to cover local, traditional, nonwestern beliefs, practices, customs and world views, and frequently also to refer to alternative, informal forms of knowledge. Although some writers reject this contraposition, 'indigenous knowledge' is commonly contrasted, implicitly or explicitly, with 'knowledge from abroad', a 'global', 'cosmopolitan', 'western', 'formal' or 'world' (system of) knowledge (*cf* Hountondji, 1995; Cresswell, 1998; Semali and Kincheloe, eds, 1999 *passim*; Odora Hoppers, 2002a; Odora Hoppers 2002 *passim*). Rather perplexingly, while a lot has been said and continues to be said about the idea of indigeneity, I have yet to come across a writer or author willing to furnish an explanation of their understanding or concept of 'knowledge'. Although the term 'knowledge' is used in liberal abundance, no account is given of the actual meaning of the term. Thus, there is a general failure among theorists to appreciate and engage with the ramifications of the concept. Instead, 'indigenous knowledge' is unquestioningly employed as an umbrella concept to cover practices, skills, customs, worldviews, perceptions, as well as theoretical and factual understandings. With regard to the second question, as to what the focus on indigenous knowledge is hoped to achieve, there are several related ideas that appear again and again (*cf* Semali and Kincheloe, 1999 *passim*; Odora Hoppers, 2002 *passim*): reclamation of cultural or traditional heritage;

decolonization of mind and thought; recognition and acknowledgement of self-determining development; protection against further colonization, exploitation, appropriation or commercialization; legitimation or validation of indigenous practices and world views; and condemnation of, or at least caution against, the subjugation of nature and general oppressiveness of non indigenous rationality, science and technology. Western knowledge, science, technology and 'rationality' have led to, or have had as a significant goal, the subjugation of nature, and so far have been devastatingly efficient. The pursuit of nuclear energy, wholesale deforestation and destruction of flora and fauna, factory farming of nonhuman animals for human consumption, vivisection and genetic engineering are deplorable and – indeed – *irrational*. The inferiorisation of indigenous peoples' practices, skills and insights has, to a large extent, been arrogant and of similarly questionable rationality. The concept of indigenous knowledge, and its 'legitimation' or 'validation', as a remedy or countermeasure is completely misguided. There is a general lack of appreciation of the semantic and logical problems involved in employing and applying the concept of 'knowledge' beyond the sense of practice or skill, while still referring to the knowledge in question as 'indigenous' and – as such – as 'fundamentally different', 'unique' and 'incommensurable' or 'incompatible' with 'modern' knowledge (Prakash, 1999, pp.160, 167, 168; Reynar, 1999, p.301, fn. 2). There is almost a complete absence of definition, even of working definitions, of this crucial idea in the various papers that have been written and published over the years.

### **Towards a definition of 'knowledge'**

If we consider how the terms 'know' and 'knowledge' are commonly used, we are able to recognize and distinguish between three main kinds: *knowledge that* or *factual knowledge*, *knowledge-how* or *practical knowledge* and, lastly, *knowledge of persons, places, or things* or *knowledge by acquaintance*. If discussion of the uniqueness of indigenous people's knowledge interprets it in the third sense, it is fairly uncontroversial. Acquaintance with states of affairs, geographical terrain etc. differs from individual to individual, society to society, culture to culture – take Afghan familiarity with their own mountainous regions, something not shared by American or Russian soldiers. However, in the discussion that follows, we concentrate primarily on the first two as the kinds of knowledge that are relevant here. The understanding of 'indigenous knowledge' as 'indigenous practice, skill or know-how', too, is reasonably unproblematic. It makes perfect sense to say that (different individuals in) different cultures or societies possess skills or know-how not shared by others. Of course, there is often a close connection between practical and factual knowledge. A traditional healer *knows how* to cure people – and this implies that she presumably *knows that* certain roots, berries or barks have the requisite disease-curing properties. The Inuit who *knows how* to distinguish between several shades of white as well as several different types of snow will be able to orientate himself accordingly, will *know that* an animal is at a certain distance from him and that a certain stretch of snow or ice will support his weight. The problem arises when the two kinds of knowledge are treated as if there is no distinction between them, or at least as if they are mutually dependent. In order to establish why this is problematic, it is needed to provide a definition of factual knowledge, or *knowledge-that*. Traditionally, this kind of knowledge (often also referred to as *propositional knowledge*) has been argued to have three necessary and logically independent components: belief, justification and truth. In order for a person to know something (*p*), she has to *believe that p*, she has to be *justified in believing that p* (i.e. she has to be *in a position to know that p*), and *p* has to be *true*. Each of these components has been considered essential. In isolation they do not amount to knowledge, but in combination they are considered sufficient for knowledge. This definition has been challenged in recent years, mainly with regard to the sufficiency of the three conditions (Gettier, 1963). In principle the objections can be met, perhaps by adding a fourth condition: a person's *justification for believing that p must be suitably connected to the truth of p*. Now, even if

these conditions are jointly sufficient for knowledge, there remains considerable room for debate over what precisely the justification condition involves – what degree of justification is required, what kind of justification is appropriate etc. (Horsthemke, 2001). However, for present purposes this (amended) definition should suffice. This conception of factual or propositional knowledge is only plausible but indispensable for clearing up some of the confusions in the debate around indigenous knowledge. In other words, the philosophical account of the nature of knowledge may be used as a yardstick. Thus, the onus will be on anyone who is opposed to the analysis presented here to propose not only an alternative but a more feasible definition, one that is sufficiently unambiguous and comprehensive. To assert, as some theorists may do, that the philosophical definition presented here is itself an instance of an oppressive, formal, non indigenous system of thought, would be to shirk the issue and to attempt to employ the very concepts that are problematised in a tacitly self-validating manner.

In some instances, ‘indigenous knowledge’ is taken to cover all kinds of beliefs, with little or no reference to truth or justification. This elevates to the status of knowledge not only mere assumption and opinion, but also superstition, divination, soothsaying and the like (as Semali, 1999, p.98, and Crossman and Devisch, 2002, p.117, attempt to do). In the absence of any explicit mention of truth, then, the applicable idea would be that of ‘indigenous beliefs’.

The Director General of United Nations Educational, Scientific and Cultural Organization (Mayor, 1994) defines traditional knowledge:

*The indigenous people of the world possess an immense knowledge of their environments, based on centuries of living close to nature. Living in and from the richness and variety of complex ecosystems, they have an understanding of the properties of plants and animals, the functioning of ecosystems and the techniques for using and managing them that is particular and often detailed. In rural communities in developing countries, locally occurring species are relied on for many - sometimes all - foods, medicines, fuel, building materials and other products. Equally, people's knowledge and perceptions of the environment, and their relationships with it, are often important elements of cultural identity.*

Warren (1991) and Flavier (1995) present typical definitions by suggesting:

Indigenous knowledge (IK) is the local knowledge – knowledge that is unique to a given culture or society. IK contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management, and a host of other activities in rural communities. (Warren 1991)

Indigenous Knowledge is (...) the information base for a society, which facilitates communication and decision-making. Indigenous information systems are dynamic, and are continually influenced by internal creativity and experimentation as well as by contact with external systems. (Flavier et al. 1995: 479)

Most indigenous people have traditional songs, stories, legends, dreams, methods and practices as means of transmitting specific human elements of traditional knowledge. Sometimes it is preserved in artifacts handed from father to son or mother to daughter. In indigenous knowledge systems, there is usually no real separation between secular and sacred knowledge and practice - they are one and the same. In virtually all of these systems, knowledge is transmitted directly from individual to individual.

How do Native people define traditional knowledge?

- It is practical common sense based on teachings and experiences passed on from generation to generation.

- It is knowing the country. It covers knowledge of the environment - snow, ice, weather, resources - and the relationships between things.
- It is holistic. It cannot be compartmentalized and cannot be separated from the people who hold it. It is rooted in the spiritual health, culture and language of the people. It is a way of life.
- Traditional knowledge is an authority system. It sets out the rules governing the use of resources - respect, an obligation to share. It is dynamic, cumulative and stable. It is truth.
- Traditional knowledge is a way of life -wisdom is using traditional knowledge in good ways. It is using the heart and the head together. It comes from the spirit in order to survive.
- It gives credibility to the people.

### **Comparisons between indigenous and scientific knowledge**

The temptation to compare scientific and traditional knowledge comes from collecting traditional knowledge without the contextual elements. For example, Native people have a far richer and more subtle understanding of the characteristics of ice and snow than do non-indigenous people. In fact, some Native classification is available only by virtue of its relationship to human activities and feelings. These comparisons sometimes incorrectly lead science practitioners to trivialize traditional understanding. Whereas scientific practice generally excludes the humanistic perspective, traditional understanding assumes a holistic view including language, culture, practice, spirituality, mythology, customs and even the social organization of the local communities. For many indigenous people today, the communication of traditional knowledge is hampered by competition from other cultures that capture the imagination of the young. They are bombarded by technology that teaches them non-indigenous ways and limits the capacity of elders to pass on traditional knowledge to the young. As the elders die, the full richness of tradition is diminished, because some of it has not been passed on and so is lost. It is important therefore to find ways of preserving this knowledge. Too often, traditional knowledge is incorrectly made parallel only to science. Science is but a small part of non-indigenous knowledge. Similarly, to suggest that traditional knowledge is only the equivalent of science is to diminish incorrectly the strength and breadth of traditional knowledge. Thus, the suggestion that traditional knowledge should be characterized as traditional science diminishes its breadth and value. While it is not appropriate to compare scientific and traditional knowledge as equivalents, the use of traditional knowledge in scientific knowledge in science means that the two knowledge bases will be in contact with each other as practitioners attempt to weave the two together.

### **Why is Indigenous Knowledge Important?**

Significant contributions to global knowledge have originated from indigenous people, for instance in medicine and veterinary medicine with their intimate understanding of their environments. Indigenous knowledge is developed and adapted continuously to gradually changing environments and passed down from generation to generation and closely interwoven with people's cultural values. Indigenous knowledge is also the social capital of the poor, their main asset to invest in the struggle for survival, to produce food, to provide for shelter or to achieve control of their own lives. Today, many indigenous knowledge systems are at risk of becoming extinct because of rapidly changing natural environments and fast pacing economic, political, and cultural changes on a global scale. Practices vanish, as they become inappropriate for new challenges or because they adapt too slowly. However, many practices disappear only because of the intrusion of foreign technologies or

development concepts that promise short-term gains or solutions to problems without being capable of sustaining them. The tragedy of the impending disappearance of indigenous knowledge is most obvious to those who have developed it and make a living through it. But the implication for others can be detrimental as well, when skills, technologies, artifacts, problem solving strategies and expertise are lost. Indigenous knowledge is part of the lives of the rural poor; their livelihood depends almost entirely on specific skills and knowledge essential for their survival. Accordingly, for the development process, indigenous knowledge is of particular relevance for the following sectors and strategies:

- Agriculture
- Animal husbandry and ethnic veterinary medicine
- Use and management of natural resources
- Primary health care (PHC), preventive medicine and psychosocial care
- Saving and lending
- Community development
- Poverty alleviation

The following case studies illustrate four ways in which indigenous people in different parts of the world use their knowledge to live sustainably. Each way is illustrated by one or more case studies from different parts of the world.

- A spiritual relationship with the land
- Natural remedies and medicines
- Sustainable resource management
- Sustainable social relationships

### **A Spiritual Relationship With The Land**

For indigenous people, the land is the source of life- a gift from the creator that nourishes, supports and teaches. Although indigenous peoples vary widely in their customs, culture, and impact on the land, all consider the Earth like a parent and revere it accordingly. 'Mother Earth' is the centre of the universe, the core of their culture, the origin of their identity as a people. She connects them with their past (as the home of ancestors), with the present (as provider of their material needs), and with the future (as the legacy they hold in trust for their children and grandchildren). In this way, indigenusness carries with it a sense of belonging to a place. At the heart of this deep bond is a perception, an awareness, that all of life - mountains, rivers, skies, animals, plants, insects, rocks, people - are inseparably interconnected. Material and spiritual worlds are woven together in one complex web, all living things imbued with a sacred meaning. This living sense of connectedness that grounds indigenous peoples in the soil has all but disappeared among city dwellers - the cause of much modern alienation and despair. The idea that the land can be owned, that it can belong to someone even when left unused, uncared for, or uninhabited, is foreign to indigenous peoples. In the so-called developed world, land is in the hands of private individuals, corporate investors, or the state and can be sold at the will of the owner. For indigenous peoples land is held collectively for the community (though competition between communities, and with outsiders, for rights of use, has sometimes led to conflict). According to indigenous law, humankind can never be more than a trustee of the land, with a collective responsibility to preserve it. The predominant Western world view is that nature must be studied, dissected, and mastered and progress measured by the ability to extract secrets and

wealth from the Earth. Indigenous people do not consider the land as merely an economic resource. Their ancestral lands are literally the source of life, and their distinct ways of life are developed and defined in relationship to the environment around them. Indigenous people are people of the land. This difference has often led to misunderstandings. Many have assumed that indigenous people have no sense of territory because they do not necessarily physically demarcate their lands. However, indigenous people know the extent of their lands, and they know how the land, water, and other resources need to be shared. They understand only too well that to harm the land is to destroy ourselves, since we are part of the same organism.

### **Case Study: The Penan and Kedayan of Brunei**

The Penan of rural Brunei have great regard for the forest. This is manifested in their perceptions of their forest environment, especially their prevailing 'Molong' concept of natural resource conservation. 'Molong' gives the Penan a sense of caring and stewardship over their forest resources. This involves responsible and moderate use of forests, so that they will continue to be sustaining for future generations. Greed has no place among the Penans. In practice, this means that when they harvest a clump of sago or rattan, they use only the mature stems, and leave the young shoots for harvesting in a few years time. Penans also greatly respect and protect the *dipterocarp* trees which produce the seeds that the wild boar eat. They do not pollute the rivers because they also know that wild boars eat the plants that grow by the river banks. They also let the boar get their share of the sago trees and protect the acorn-producing trees which the boars also love. The Penans have a great fear of treefellers who cut the trees indiscriminately in their jungle because they are afraid that the disturbance will decrease their food supply. The forest seems to be everything to the Penans. They feel an affinity with it and are thankful for its supply of staple foods, building materials, medicines and raw materials for their handicraft. The forest is their world and they live in harmony with it and so guard it tenaciously. Until the last few decades, the Kedayans, another rural people of Brunei, have survived by carefully utilizing forest, land and wildlife for their livelihood. Through their day-to-day activities of agriculture and hunting, they utilized and extracted forest resources to produce food and manufacture materials for their consumption and tools for their survival activities, respectively. They have been practicing this way of life through many generations, using a complex and highly adaptive system, such as cultivation of hill and swamp rice. To cultivate their staple food, rice, they used different agricultural techniques, both shifting and permanent, depending on the different types of padi (such as, tugal, paya, hambur, tanam) they were growing. Well into the 20th century, the Kedayans were traditionally shifting agriculturists, felling, burning and planting hill padi in successive hillsides in succeeding years. An example of areas subjected to this method of rice cultivation is the very rural parts of Temburong, such as Kampong Piasaw-Piasaw. Today, a large part of Temburong is still covered with forest - evidence that the Kedayans have not over-exploited or misused their forest environments. In short, it has been their harmonizing and systematic methods of using their environments (particularly land and forests) that have enabled them to practice similar economic activities through many generations to produce food and manufacture materials, not only for themselves but also to sell the surplus to non-agricultural people in the country.

(Sources: Adapted from Burger, J. (1990) *The Gaia Atlas of First Peoples: A Future for the Indigenous World*, Penguin Books, Ringwood, p. 20; Ulluwishewa, R., Kaloko, A. and Morican,

D. (1997) *Indigenous Knowledge and Environmental Education*, Paper presented at Environmental Education Workshop, University of Brunei, Darussalam, pp.3-4.)

**Natural Remedies and Medicines**

In many parts of the world, indigenous societies classify soils, climate, plant and animal species and recognize their special characteristics. Indigenous people have words for plants and insects that have not yet been identified by the world's botanists and entomologists. The Hanunoo people of the Philippines, for example, distinguish 1600 plant species in their forest, 400 more than scientists working in the same area. Of the estimated 250,000 to 500,000 plant species in the world, more than 85% are in environments that are the traditional homes of indigenous people. Nearly 75% of 121 plant-derived prescription drugs used worldwide were discovered following leads from indigenous medicine. Globally, indigenous peoples use 3000 different species of plant to control fertility alone. The Kallaywayas, wandering healers of Bolivia, make use of 600 medicinal herbs; traditional healers in Southeast Asia may employ as many as 6500 plants for drugs. Almost all trees and many plants have a place in medicinal lore. Some scientists now believe that indigenous knowledge may help them to discover important new cures for diseases such as AIDS and cancer. Many developed countries realize the potential for indigenous medicine. It is locally available, culturally acceptable, and cheaper than imported drugs.

### **Case Study: Medicinal Plants in India**

Indigenous people work on body and mind together to help cure illness. Medicinal plants are used to treat the spiritual origins of disease as well as the physical symptoms. The vast knowledge of such plants is now beginning to be acknowledged by the rest of the world. So is the role played by indigenous people as custodians of the world's genetic heritage. A botanical survey of India revealed that tribal peoples of the north-east use plant drugs to cure fevers, bronchitis, blood and skin diseases, eye infections, lung and spleen ulcers, diabetes, and high blood pressure. Knowledge of their use is passed on by the 'vaiyas', Indian herbal medicine doctors. In a single area of 277 sq. km (107 sq. miles) 210 types of medicinal plants have been found. The Kameng and Lohit peoples in Arunachal Pradesh crush a bulk of *Fritillaria cirrhosa* to a paste to relieve muscle pains. Research has now confirmed the presence of a chemical similar to cocaine in a related *Fritillaria* plant that brings relief to muscular pain. Growing evidence of plant-based contraception is available among many tribal peoples. Worldwide, over 3000 plants are employed for contraceptive use. In the Karjat tribal area of Maharashtra, near the west coast of India, a native herb taken twice a year is said to be effective. The Karjat study concludes that traditional health practices can provide up to half of local primary health needs. Enlightened health-care workers are beginning to re-introduce traditional plant remedies where allopathic drugs have become common-place. Properly studied and recorded, this traditional knowledge could revolutionize the world of medicine.

*(Source: Burger, J. (1990) The Gaia Atlas of First Peoples: A Future for the Indigenous World, Penguin Books, Ringwood, pp. 32, 38.)*

### **Sustainable Resource Management**

The industrial world is facing an ecological crisis. Yet few industrial economists would admit they could learn from indigenous people. Their economies are often called 'primitive', their technology dismissed as 'Stone Age', and most governments assume they can benefit only from salaried employment. Yet these traditional ways of life have proved highly durable. Hunting and fishing have allowed the Inuit to survive in the Arctic; nomadic pastoralism provides a livelihood for people in the arid Sahelian region of Africa; shifting cultivation has sustained hundreds of distinct cultures in the fragile ecosystem in the Amazon and the forests of Southeast Asia. Non-indigenous people have not been able to survive in these extreme conditions without destroying the balance of the ecosystem. The key to this success is sustainability. Indigenous people today use the resources available without depleting them. They use their intimate knowledge of plants, soils, animals, climate, and seasons, not to exploit nature but to co-exist alongside it. This involves careful management, control of population, the use of small quantities but a wide diversity of plants and animals, small surpluses, and minimum wastage. Plants provide food, medicines, pesticides, poisons, building materials; animals provide meat, clothes, string, implements, oil. Indigenous knowledge of nature has ensured the survival of many people in fragile habitats. But it is a knowledge centered not on exploitation but on the harmony of the natural world. All flora and fauna have a place in an ordered universe made up of humankind, nature, and spirits. Indigenous cultures also help to protect the natural world from destruction through religion and rituals. Animals are commonly held in respect and their numbers maintained, often through careful management. Those following the Buddhist religion in India, for example, have survived many droughts because they will not kill an animal or a tree. They breed cattle selectively, monitor the feeding of their camels, and live on milk, yogurt and a few cultivated crops. Many people have developed a detailed understanding of animal behaviour. Those living in tropical forests, for example, recognize

that where two different ecological zones meet, the hunting is more productive. Many even grow crops or trees to attract certain animals and increase their numbers.

### **Case Study: The Karen of Thailand**

Shifting cultivation (sometimes called 'slash and burn') is a sustainable economic system that need not harm the environment. It is the most commonly practised system among indigenous people of Asia and lowland Latin America, and provides them with a high degree of economic independence and cultural integrity. Given sufficient land and low population density, it is a highly successful way of using the forest. The Karen of Thailand practise this system. The economy of the Karen people is based almost exclusively on subsistence dry rice production. An area is cleared of trees, undergrowth is burned, rice planted and later harvested. Each year a new site is chosen and the cycle takes seven years to return to the site first cleared. The system permits regeneration of the forest and thin tropical soils, and does not expose the steep slopes to heavy rains, which would eventually wash away the soil in a fixed field system. Money has virtually no place in a Karen community. If a village has enough food it is prosperous. When villagers say 'we have enough rice', it means not simply that they will survive, but that they have everything they need. If, however, shifting cultivation is unable to provide for the entire needs of a village, the people grow chilli or bamboo shoots, or they may collect and sell honey or other forest produce. Nearly all the income raised is used to buy rice.

*(Source: Burger, J. (1990) The Gaia Atlas of First Peoples: A Future for the Indigenous World, Penguin Books, Ringwood, pp. 40, 44)*

### **Sustainable Social Relationships**

Social cohesion has been the key to survival for many indigenous cultures. Food gathering and hunting depend on mutual support and co-operation, and disharmony within a part of the group is dangerous to the whole. In many cultures men and women have developed complementary, if not equal, roles; political decisions are arrived at by consensus in many cultures, and other social arrangements that benefit the entire community have often been incorporated into indigenous cultural traditions. Marriage, for example, is an integral part of the social system - political, economic, and spiritual - in many indigenous societies. For example, in Thailand, a Hmong groom must pay a high dowry but, in turn, the wife becomes a member of the husband's clan under the direct authority of the household. Marriage can also ensure political stability for the community (by regulating exchange between groups), and continuing harmony with the spirit world. For essentially religious reasons, marriage may be prohibited between a man and woman of the same kin group; in other societies it can only take place within the kin group. The notion of marriage as a relationship founded only on the bond of romantic love is rarely, if ever, seen in traditional societies. The nuclear family, too, is a rare concept. A complex interweaving of lineage, clan, and family connections means that most individuals are related to each other - tradition that fosters the sense of belonging to the group, and of the need to share. Even decisions about having a child are, in some societies, controlled by laws, helping to keep the population stable. In Melanesia, children are sometimes adopted to rebalance the size of families. The physical architecture of a village frequently reflects the social architecture of the people. In some communities, for example, among the highlanders of West Papua (Irian Jaya) the chief's home is separated from the other houses to emphasize the social hierarchy. By contrast, the Karen of Thailand, who have a high degree of household autonomy and social equality, have no village centre and all live in similar houses.

### Case Study 1: Maori of Aotearoa (New Zealand)

The Maori established a system of justice with a highly developed oratory, but no codified set of laws, courts, and judges. When the British imposed their own legal system on New Zealand, the rules took no account of Maori culture. Traditional Maori justice was based both on the material and the spiritual worlds; redress for minor offences was determined by the community, more serious ones by the elders or chiefs. Punishment would be exacted by a transfer of goods known as *utu*, or satisfaction, to the injured party. Persistent theft or murder, however, was punishable by *muru*, or plunder, but only after full and formal discussion with reference to the true or customary principles. Other offenders might receive a beating, the withdrawal of community assistance, or, worst of all, banishment. In some respects there are similarities between traditional Maori law and that imported by the British. But the similarities ended with matters of the spirit world. Chiefs with spiritual power could use it to conserve parts of the land for a feast. Access to the land was prohibited and violation would anger the spirits. Strangers unwittingly entering such areas would force the community to exact compensation, or even kill the intruder, in order to avoid being punished themselves by the spirits. Respect for the spirit world was fundamental to Maori society, but fell outside the comprehension of the British legal system.

### Case Study 2: Papua New Guinea

World wars have torn societies apart, but not all societies are so destroyed by conflict. Within some indigenous communities, conflict is regulated by customary law. Rather than starting a war, aggression is normally channelled into a ritualized process of war-making and long-term destruction is minimal. In Papua New Guinea hostilities between groups are a part of the cycle of events encompassing long periods of peace and enmity. War is just one aspect of cultural life. The idea of annihilating the other group is absent; indeed, the Tsembaga and Mae Enga are known as the peoples who marry their enemies. War is a means by which the individual and the group find their identity, and is largely ceremonial. War may be precipitated by theft, poaching, or - most serious - the killing of someone else's pig - or long-standing disputes over territory and resources may create permanent hostilities. The Big Man, the nonhereditary chief, may try to avoid war by negotiating compensation or an exchange of gifts, but he cannot impose a decision. Equally, individuals do not take justice into their own hands as an unresolved dispute entails obligations for the whole group. But even on the point of war there is always a ritual means of stepping back from open confrontation. Anger can be channelled into a 'nothing fight', a competition of insults and shouting; or else it may lead to a real fight, with blows exchanged and sometimes even serious casualties. After a war a lengthy process of peacemaking begins. Gifts, ceremonies, and marriages establish links and obligations between the parties.

(Source: Burger, J. (1990) *The Gaia Atlas of First Peoples: A Future for the Indigenous World*, Penguin Books, Ringwood, pp. 50, 61-62)

Indigenous communities have lived in harmony with the environment and have utilized resources without impairing nature's capacity to regenerate them. Their ways of living are sustainable. Traditional knowledge incorporates knowledge of ecosystem relationships and a code of ethics governing appropriate use of the environment. This code includes rules and conventions promoting desirable ecosystem relations, human-animal interactions and even social relationships, since the latter continue to be established and reaffirmed through hunting and other activities on the land. Traditional knowledge articulates with nontraditional knowledge to form a rich and distinctive understanding of life and the world. Many Natives view the extraction of their traditional knowledge from its broader cultural context as a form of theft and, understandably, have been reluctant to share the depth and breadth of what they know with outside interests. They also fear that, because many wildlife

managers and decision-makers do not understand their culture, customs or values, their traditional knowledge will somehow be used against them (e.g. setting quotas and other hunting regulations). At best, piecemeal extraction of traditional knowledge from its larger cultural context invites misrepresentation and misinterpretation. At worst, it represents a form of misappropriation and cultural exploitation. Indigenous knowledge shaped their values and attitudes towards environment, and it is these attitudes and values, which have guided their actions and made them sustainable. Therefore, indigenous knowledge can help to develop sensitive and caring values and attitudes and, thereby, promote a vision of a sustainable future.

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