

Indigenous and Traditional Knowledge

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*{Published in Vol 5, Encyclopedia of Sustainability. Berkshire 122 Castle Street
Great Barrington, MA 01230. (2012)}*

Abstract: Indigenous knowledge takes many forms, reflecting the culture and geographic location as well as historic influences introduced from outside forces. Indigenous knowledge is increasingly understood to be foundational to western science though measured by different standards. Indigenous peoples and Western scholars have begun to practice collaborative sharing and knowledge negotiations, learning from each other and sharing knowledge that can be applied to human sustainability challenges.

Indigenous and traditional knowledge systems are important to all of humanity as the wellspring from which all knowledge originates. The complexity of social, economic, political, and environmental sustainability challenges has prompted scholars, political leaders, and theologians on every continent to search for sources of knowledge that will provide the best solutions to problems that affect everyone and everything on the planet. Indigenous peoples themselves have joined the effort to address problems of sustainability by offering to share their knowledge, in exchange for protections.

Knowledge systems originate in human cultures as societies develop their relationships to other peoples, the Earth, and the cosmos. What defines the terms *indigenous knowledge* and *traditional knowledge*? How do they differ, and how are they the same? Are some knowledge systems more important or valuable than others? Is there only one “science” or are there many sciences? Is indigenous knowledge or traditional knowledge applicable to illuminating the pressing challenges threatening humankind, such as poverty, food security, climate change, war and peace, illness and disease? Indigenous peoples offer their own perspectives on the content and form of knowledge, and the worldwide academic community has joined in an effort with governments, business, nonprofit

organizations, and international organizations to explain, define, and comment on indigenous knowledge and traditional knowledge.

Social, economic, and political globalization beginning in the late 1960s thrust metropolitan and indigenous societies into closer proximity, resulting in greater demand for effective communication among them. As indigenous peoples actively engage in efforts to solve complex problems created by human action or natural phenomena, academics, national decision makers, nonprofit organizations, and business planners recognize the significance and relevance of indigenous knowledge and traditional knowledge to the development of new strategies for meeting the challenges of the twenty-first century. Bridging the significant knowledge gap between metropolitan and indigenous societies became an acknowledged priority when the United Nations Commission on Human Rights commissioned José Martínez Cobo as a Special Rapporteur in 1973 to conduct a thirteen-year “Study of the Problem of Discrimination Against Indigenous Populations” (UNCHR 1986) and especially after the UN General Assembly adopted the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) in 2007. International organizations, nongovernmental organizations, governments, and indigenous peoples themselves now seek to record and document indigenous knowledge systems to contribute to sustainability solutions.

Indigenous and Traditional Knowledge

The knowledge and intellectual traditions of indigenous peoples embody significant information on a diverse range of topics, including architecture, irrigation, health and nutrition, child rearing, botanical sciences, forest management, and astronomy. Interpreting and understanding indigenous knowledge systems has become a top priority in the search for answers to the human survival questions of sustainability and the effective responses to adverse affects of climate change. The effort to understand indigenous and traditional knowledge is complicated because such language is often veiled in ancient languages and cultural practices, because of the complex diversity among indigenous peoples, and because their indigenous societies are sometimes located in remote and inaccessible places.

Indigenous peoples exist on every continent except Antarctica. Researchers disagree on the number of indigenous societies in the world, but most often the number has been placed between 6,000 and 7,000 different peoples. What qualities identify these peoples as different from one another may be language, history, territorial location and climatic environment, heritage, social, economic, and political practices, and culture. A group's degree of isolation from or interaction with other groups influences whether knowledge systems are unique to a particular people or part of a broader collection of peoples.

The expression *indigenous knowledge* is often equated with the expression *traditional knowledge*, and indeed they are regularly used interchangeably. Word usage is important, since using *indigenous knowledge* (IK), *ethnoecology*, *local knowledge*, *indigenous technical knowledge* (ITK), *folk knowledge*, *traditional knowledge* (TK), *indigenous science*, *traditional environmental knowledge*, (TEK) or simply *people's science* can signal how an individual or group is approaching a topic or presenting underlying assumptions (Ellen and Harris 1996). David Turnbull, quoting from several researchers in his article "Working on Incommensurable Knowledge Traditions," gives specific meaning to *local knowledge* by suggesting that it results from observations of the "local environment or at a particular site and held by a specific group of people"; he goes on to explain the view that traditional knowledge is a "cumulative body of knowledge and beliefs, evolving by adaptive process and handed down through generations by cultural transmission" (Turnbull 2009, quoting Fikret Berkes and Carl Folke). Whichever form one chooses, "indigenous knowledge" identifies a specific body of knowledge associated with a specific people and locality involving an understanding or possession of information, facts, ideas, truths, or principles. Examples of indigenous knowledge include architectural and building principles and ideas for constructing the Egyptian (c. 2500 BCE), Mayan (c. 1000 BCE) and Mississippian (c. 800 CE) pyramids, the ancient city of Anasazi (1200 BCE), the city at Machu Picchu (c. 1400 CE), and the mountaintop city of Cusco (circa 1100 CE), or ancient castles such as Sigiriya (circa 300 BCE). Indigenous knowledge has informed systematically engineered aqueducts in the Tibetan

Kingdom (c. 100 BCE) and in modern Sri Lanka. Throughout the world indigenous peoples not only engage in engineering that produces vast transportation systems on land and water (rivers, lakes, and oceans), but on health and healing systems such as *ayurveda* (1500 BCE) and cosmologies and mathematical or numbering systems (Swaziland numbering c. 35,000 BCE, Northern Europe numbers c. 3000 BCE, Egyptian mathematics c. 2000–1800 BCE, Mayan mathematics c. 2000 BCE, Chinese mathematics c. 300 BCE, or Persian mathematics c. 700 CE). Calendrical systems, social organization, economic systems, manufactured textiles, wood and stone construction, the smelting of metals for tools and ornamentation, and organized systematic food and natural resource management systems have all been developed by indigenous knowledge. Some of this knowledge informs contemporary knowledge systems, while much remains to be reclaimed.

Traditional knowledge often refers to a more generalized expression of knowledge associating a people or peoples with time-honored ideas and practices associated with an individual or family. Such knowledge may include spiritual incantations or healing practices; fishing, hunting, and other food producing methods; styles and methods for manufacturing baskets or other containers; and art forms such as drawing, carving, singing, playing a musical instrument, dancing, and sculpting. While there are distinctions to be made between indigenous and traditional knowledge, there is sufficient overlap between the meanings of these and related terms to allow for their interchangeability.

Defining Indigenous Knowledge

Although scholars (both indigenous and non-indigenous), organizational doctrines, and institutions contribute to a substantial body of literature that offers various definitions of *indigenous knowledge*, no common understanding or widely accepted definition has materialized. Depending on the intended use for the definition (academic, political, policy-oriented, or demographic), authors have refrained from becoming too specific, making an effort instead to embrace the many different knowledge systems practiced by indigenous peoples.

Erica-Irene Daes, the chairman-rapporteur for most of the existence of the United Nations Working Group on Indigenous Populations (in effect from 1982 to 2006) offered what is both a scholarly and working policy definition of indigenous knowledge: “[the] heritage of an indigenous people is not merely a collection of objects, stories and ceremonies, but a complete knowledge system with its own concepts of epistemology, philosophy, and scientific and logical validity” (Daes 1994, para. 8). This definition is intended to apply generally to all different indigenous knowledge systems and is therefore broadly useful for policy, but it is of limited benefit when addressing a specific knowledge system of a specific indigenous people or peoples. One may begin to explore an indigenous knowledge system with this definition, but not actually comprehend or understand the specific body of knowledge.

The UN Environmental Programme (UNEP) combines the broader approach to defining indigenous knowledge with recognition of the variety of knowledge systems that exist in different indigenous communities. UNEP states its definition as follows:

Indigenous Knowledge (IK) can be broadly defined as the knowledge that an indigenous (local) community accumulates over generations of living in a particular environment. This definition encompasses all forms of knowledge—technologies, know-how skills, practices and beliefs—that enable the community to achieve stable livelihoods in their environment. A number of terms are used interchangeably to refer to the concept of IK, including Traditional Knowledge (TK), Indigenous Technical Knowledge (ITK), Local Knowledge (LK) and Indigenous Knowledge System (IKS).

IK is unique to every culture and society and it is embedded in community practices, institutions, relationships and rituals. IK is considered a part of the local knowledge in the sense that it is rooted in a particular community and situated within broader cultural traditions. It is a set of experiences generated by people living in those communities. (UNEP 2011)

The International Bank for Reconstruction and Development, commonly known as the World Bank, notes the controversies surrounding different definitions for indigenous knowledge, but it tends to favor this view:

Indigenous knowledge is developed and adapted continuously to gradually changing environments and [is] 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.

The World Bank's approach is functional and specifically directed at the application of indigenous knowledge to problems and solutions for development.

These definitions attempt to give a broad interpretation of indigenous knowledge as complete systems, whereas some scholars tend rather to narrow indigenous knowledge, confining its meaning to local and environmental topics. Louise Grenier, a Canadian researcher, defines indigenous knowledge as "the unique, traditional, local knowledge existing within and developed around the specific conditions of women and men Indigenous to a particular geographic area" (Grenier 1998, 1).

As a result of their work in Bolivia and Wales, sociologist Alberto Arce and researcher Eleanor Fisher suggest that a "utilitarian representation of knowledge" by individuals observing indigenous knowledge is only a vague interpretation of the everyday application of knowledge or "local knowledge," and this approach misses the political and social challenges of a people (Arce and Fisher 2003, 80). By this view, using an observational "lens" prevents a full understanding of the knowledge placed within its social, economic, and political environment. How that knowledge is applied to the actual struggles of a people is lost. To effectively achieve the full application of indigenous knowledge it is essential to recognize the social and political context and bridge cultural boundaries. Arce and Fisher urge negotiated exchanges of knowledge and the application of agreed knowledge.

Scholars have taken on the task of defining indigenous knowledge responding to the challenge of the International Council for Science (ICSU) working group study, which takes the position that indigenous knowledge cannot be assembled. The ICSU asserts that such knowledge "differs from scientific knowledge in that it is local, place based, diverse, and hence incommensurable and incapable of being validated by common standards," but that it is a science that informs western science. (Fenstad, et al., 2002; Aikenhead, 2007). Taking

the idea that indigenous knowledge is diverse and turning that to a virtue, Turnbull cites the definition of George J. Sefa Dei, an Ontario-based scholar who has done much research in Nigeria and Ghana:

A body of knowledge associated with the long-term occupancy of a certain place. This knowledge refers to traditional norms and social values, as well as to mental constructs that guide, organize and regulate the people's ways of living and making sense of their world. It is the sum of experience and knowledge of a given social group and forms the basis of decision making in the face of challenges both familiar and unfamiliar. (Dei, Hall, and Goldin Rosenberg 2000)

Clash of Cultures

Diana Taylor (1991), a scholar focused on performance art in the Americas (especially Latin America), contends that culture has two parts. The first of these she attributes to the thinking of social scientists such as the nineteenth-century German sociologist Max Weber and twentieth-century US anthropologist Clifford Geertz. In this view, Taylor suggests, social scientists claim that culture is resilient, persistent, and self-identifying. Taylor quotes Geertz as writing that culture is “an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which [people] communicate, perpetuate and develop their knowledge about and attitudes towards life” (Taylor 1991, 91). This viewpoint pervasive, among social scientists generally, gives emphasis to the difficulty of cross-cultural communications. Indigenous and traditional knowledge systems, this view would claim, can express meaning across cultural borders only with great difficulty if at all.

“Separate and equal” versus “gradual fusion” represent the contrasting perspectives describing the “clash of cultures,” and by extension the contention between knowledge systems.

Conveying Knowledge across Cultural Boundaries

The knowledge systems of indigenous societies have long been set aside as if they are separate from what is commonly identified as Western knowledge. Closer

examination of indigenous knowledge by Western scholars and scientists is revealing the importance of valuing diverse knowledge systems and thereby expanding the global knowledge base in order to meet the challenges of sustainability, climate change, food security, health, climate refugees and famine, and political stability. Reaching across cultural boundaries to share knowledge, insights, and solutions to a myriad of problems has become more urgent as the trend of globalization accelerates human interaction.

Diversity of Knowledge

Indigenous peoples' knowledge systems vary from locality to locality and from region to region, reflecting the cultural distinctiveness for each people resulting from their dynamic and evolving relationships with the land and the cosmos. There is not just one form of indigenous knowledge, there are many. While the sources, structures, and methods for acquiring knowledge differ, the themes of change and relationships occur repeatedly.

Rudolph C. Rýser, from Taidnapum-Cowlitz and founder of the Center for World Indigenous Studies (CWIS), notes that there are numerous ways of knowing that express the knowledge of different peoples. He writes that there are “five different, but related, modes of thought [that] have led to knowing, achieving the ultimate expression of consciousness: apprehending the living universe” (Rýser 1998, 19). While there are clearly many culturally animated systems of knowledge, Rýser credits the Greek, Chinese, Romans, Nubians, Indo-Arians, and Mayans for developing civilization-wide bodies of knowledge. The Greek system of thought-based knowledge developed through observation and cycles in which events repeated over time. The Chinese and Nubians contributed a system based in fatalism, where knowledge is expressed in terms of inevitability and certainty. The Roman system of thought was amplified by the Roman Catholic Church through the ages in the form of providentialism, where knowledge is based on the belief that God's will is evident in all things and that the will of God predetermines outcomes. Progressivism, a mode of thinking rooted in the ideas of the seventeenth-century French philosopher René Descartes,

bases knowledge on reason, empirical evidence, and constant change. The view developed from Descartes' time posits that knowledge advances toward the good (progress) while inevitably relegating what is considered backward or primitive to the dustbin of history. Rýser offers a fifth mode of thought that generates new knowledge as well—typical of knowledge systems in the Americas before colonization. Likening the system to a spiral, he contends that indigenous peoples responsible for building pyramids, great cities, a mathematical system, calendars, agricultural systems, and social order in the Americas rely on constantly changing conditions where evidence of an event at one point may no longer serve as evidence in the future. These examples of knowledge systems reflect the diversity of human experience over time and at different locations in the world.

All of these knowledge systems contribute to “Western sciences” (or what Rýser calls progressivism) as defined by the European seventeenth-century Age of Enlightenment in which “humanism produced a version of human nature by tethering to human-ness the requirement of rationality” (Watson 2008, 258). Indigenous knowledge should be understood to be equal to Western sciences and the knowledge of indigenous peoples, such as that having to do with hunting wildlife for food, for example, should be compared with the knowledge of wildlife biologists and ecologists. Indigenous knowledge systems express concepts and ideas in virtually all domains of Western science and over time have directly and indirectly informed Western science as a whole.

Applying Indigenous Knowledge to Modern Challenges

Faced with significant changes in the environment resulting from human activity and natural changes recognized beginning in the 1960s, economies around the world struggled with water shortages, desertification, soil erosion, forest degradation, social dislocation, and water pollution. International bodies notably led by the UN Environmental Program (UNEP) began searching for solutions. Indigenous peoples' rights was introduced into the UN global agenda in the 1970s, and by the 1980s the possibility that indigenous peoples' knowledge could benefit the world's economies began to be considered in new international treaties

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and agreements—especially those dealing with the environment, natural resources, and climate.

Five years after the UN Environmental Program convened the Ad Hoc Working Group of Experts on Biological Diversity in November 1988, the Convention on Biological Diversity (December 1993) became official law with the support of 192 UN member states. This agreement is particularly noteworthy due to the inclusion of a specific article asserting that parties to the agreement will respect, preserve, and maintain indigenous knowledge; the agreement emphasized sharing the benefits of that knowledge as it applied to conservation and sustainability. The particular language used in this convention set in motion efforts to include similar language in subsequent treaties and agreements. In particular, Article 8(j) of the Convention on Biodiversity states:

Each contracting Party shall, as far as possible and as appropriate: Subject to national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices. (CBD 1993, 8(j))

In March 1994, UN member states approved the UN Framework on Climate Change Convention (UNFCCC), establishing a major commitment to documenting, understanding, and applying traditional knowledge to reduce the adverse affects of climate change and develop adaptation strategies. In 1996, the UNFCCC began negotiation of a new climate change treaty to replace the Kyoto Protocols that had been originally developed to implement the 1994 convention. Indigenous knowledge is an increasingly important part of the global debate over best approaches to sustainability.

Traditional knowledge became the focus of another international agreement, the UN Convention to Combat Desertification (UNCCD) in 1996, focusing on countries that face significant drought or desertification. The central locations for drawing on indigenous knowledge in this arena are Africa, the Middle East, and the Mediterranean. A very specific study conducted for the UNCCD centering on traditional knowledge was completed in 1999. The objectives of this study included explaining the main attributes of traditional knowledge, developing an inventory of traditional knowledge in the Mediterranean and identifying successful approaches, and assessing the uses of traditional techniques.

This agreement in its many forms it is used to predict and aid in early escape from the consequences of tsunamis, predict and cope with droughts, and traverse the open oceans between islands in the Pacific, the Caribbean Sea, the Atlantic Ocean, and the Indian Ocean.

Samoan indigenous knowledge about the medicinal benefits of the bark of the mamala tree has been of great interest to researchers at the University of California, Berkeley, who have eagerly sought access to the knowledge and to the trees for the purpose of extracting *prostratin*, a drug thought to be beneficial for treating the disease HIV (Shetty 2004).

Indigenous knowledge about the “sweet plant” cultivated and used for centuries by the Guarani people of Paraguay demonstrated the beneficial uses of *Stevia rebaudiana Bertoni* (commonly known as stevia), as a sweetener for bitter teas. The plant’s natural sweetness is considered useful for sweetening beverages and baked foods while not promoting tooth decay, hypertension, and unbalanced flora in the intestines, as common sugar does.

Richard “Umeek” Atleo, hereditary chief of the Nuu-chah-nulth people located on Canada’s Vancouver Island, presents their perspective on indigenous knowledge as “an integrated and orderly whole, [which] thereby recognizes the intrinsic relationship between the physical and spiritual realms” (Atleo 2004). Atleo based this explanation on listening to, remembering, and interpreting origin stories. He regards the Nuu-chah-nulth knowledge system as conceived through

the method of *oosumich*, which joins the physical and the spiritual realms to explain phenomena in life, as being similar to the vision quest undertaken as a rite of passage in many Native American groups. Since *oosumich* is both a personal and secret method, the possibility of joining it with the Western scientific method is problematic. Atleo believes, however, that the Nuu-chah-nulth method of knowledge creation is not inconsistent with the empirical method and that the two methods applied together can bridge the cultural gap and permit the expansion of human knowledge for meeting human challenges.

Placing the Nuu-chah-nulth body of knowledge alongside the knowledge of other peoples to produce a synthesis that is beneficial to both exemplifies the expected outcome offered by those seeking to support indigenous peoples. The conventional approach of transferring knowledge used by development agencies such as the UN Development Programme (UNDP) presumes that one body of knowledge offers a superior solution to problems and challenges faced by “less developed peoples.” This approach has rapidly fallen out of fashion owing to increasing levels of resistance waged by peoples on whom “development” is promoted. A more productive approach in relations between development-oriented agencies is one of collaboration and negotiation where all parties presume a position of equality and sharing.

In the Ovamboland and Kavango region of Botswana and Namibia, the collaborative approach is being employed to promote economic and environmental sustainability through the domestication of local fruit trees. Indigenous knowledge about the best selection of trees and growing conditions in dryland areas is critical to the successful crop propagation (UNESCO 1994–2003).

Indigenous knowledge contributes to the reformation of institutions in India’s Ajmer District, Rajasthan, in the more than 100 villages of Silora Block, through the Barefoot College. This organization was founded in 1972 to apply indigenous knowledge and skills to solve problems in the villages and the region in a manner different from the educational system introduced by the British. The

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result is that the community develops its own expertise, reducing the people's dependency on outside help, which is often seen as useless by villagers.

Examples of applied indigenous knowledge in connection with human sustainability across the full spectrum of human endeavors may be found in indigenous communities, villages, towns, and cities throughout the world. When collaboratively negotiated, indigenous knowledge systems become effective contributors to the global knowledge base for meeting the challenges faced by humankind.

A Shift in the Twenty-First Century

Indigenous knowledge, traditional knowledge, and local knowledge are varied ways of labeling the knowledge systems developed and used by more than 6,000 different groups of indigenous peoples throughout the world. These systems of knowledge are part of the global body of knowledge, but with the expansion of European, Asian, and African peoples throughout the world in the sixteenth through the twentieth century, the knowledge systems of indigenous peoples was subordinated to colonizing powers. The challenges of sustainability in the twenty-first century created a shift in attitude toward recognizing indigenous knowledge as not only equal to other forms of knowledge, but also essential to be understood and incorporated into the global body of knowledge for the benefit of all humankind.

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See also [cross references to come]

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