Indigenous Peoples and Traditional Knowledge

Rudolph C. Rÿser
Center for World Indigenous Studies

Citation: Ryser, Rudolph C. (2011) Indigenous Peoples and Traditional Knowledge, Berkshire Encyclopedia of Sustainability 5/10, Ecosystem Management and Sustainability. (In Press)

Abstract

Indigenous knowledge takes many forms reflecting the culture and geographic location as well as historic influences introduced from outside forces. Western scholars view indigenous knowledge through intellectual lenses with frequently superficial interpretations of the actual content and meaning. Indigenous peoples and Western scholars have begun to practice collaborative sharing and knowledge negotiations. Participants learn from each other sharing knowledge that can be applied to human sustainability challenges.

The knowledge of indigenous peoples is little understood in universities and colleges, nor is it well understood in international and non-governmental organizations or governments. Indigenous and traditional knowledge systems are important to all of humanity as the wellspring from which all knowledge originates. The complexity of global and local social, economic, political and environmental sustainability challenges has caused 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 all things on the planet. Indigenous peoples themselves joined the effort to address problems of sustainability by offering to share their knowledge, but with required protections. Knowledge systems originate in human cultures animating societies and their relationship to the other human cultures, the earth and the cosmos. What is "indigenous knowledge?" What is "traditional knowledge?" How do they differ? 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 or answering humanities' pressing challenges such as poverty, food security, climate change, war and peace, illness and disease, and the myriad of other quandaries threatening human security? International organizations, academics, and non-governmental organizations actively pursue answers to these questions. Indigenous peoples and their organizations offer their perspectives on the content, form, and system of knowledge, and the academic community world-wide has joined in an effort with states' governments, business, non-profit 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 societies and indigenous societies in closer proximity to one another resulting in greater demand for effective communications. As indigenous peoples actively engage as participants in local, regional and global efforts to solve complex problems created by human action or natural phenomena, academics, country decision-makers, non-profit organization 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 societies and indigenous societies became an urgent concern when the UN Commission on Human Rights commissioned Dr. José Martínez Cobo as a Special Rapporteur in 1973 to conduct a thirteen-year "Study of the Problem of Discrimination Against Indigenous Populations" (1986) and especially after the United Nations General Assembly adopted the UN Declaration on the Rights of Indigenous Peoples in 2007. International organizations, non-governmental organizations, governments and indigenous peoples themselves now seek to record and document indigenous knowledge systems to contribute to sustainability solutions.

Defining Indigenous and Traditional Knowledge

United Nations agencies, governments, academic institutions and scholars deem it essential to understand and record the knowledge and intellectual traditions of indigenous peoples on a diverse range of topics such as architecture to irrigation, health and nutrition to child rearing, and botanical sciences, forest management and astronomy. Interpreting and understanding indigenous knowledge systems that are often veiled in ancient languages, rituals and cultural practices is a top priority for scholars, political leaders and conventional scientists searching for answers to the human survival questions of sustainability and effective responses to the adverse affects of climate change. The effort to recognize, understand and communicate indigenous and traditional knowledge across cultural boundaries is complicated by the sheer complexity of diversity among indigenous peoples and their location in sometimes remote and inaccessible places.

Indigenous peoples are located in small and in large regions on very continent except Antarctica. Ethnologists, anthropologists and demographers disagree on the number of indigenous societies there are in the world, but most often the range has been placed at between 6000 and 7000 different peoples. What qualities identify these peoples as different from one another may be language, history, territorial location and climatic environment, heritage, customary social, economic and political practices and culture. Isolation and or interaction with other peoples and the specific social, economic, political, environmental and cultural circumstances of a people accounts for the existence of knowledge systems either 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 often 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 you are approaching the topic or the underlying assumptions you make (Ellen & Harris, 1996). Turnbull gives specific meaning to "local knowledge" by suggesting that it is a kind of knowledge resulting from observations of the "local environment or at a particular site and held by a specific group of people." He goes on to explain his 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). In 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 (circa 2500 BCE), Mayan (circa 1000 BCE) and Mississippian (circa 800 CE) pyramids, the ancient city of Anasazi (1200 BCE), city at Machu Picchu (circa 1400 CE) and the mountain top city of Cusco (circa 1100 CE), or ancient castles such as Sigiriya (circa 300 BCE) and systematically engineered aqueducts in modern Sri Lanka and the Tibetan Kingdom (circa 100 BCE). Throughout the world indigenous peoples not only engage in engineering that produces vast transportation systems on water (rivers, lakes and oceans) and land, health and healing systems such as *ayurveda (1500 BCE)*, cosmologies and mathematical systems (Swaziland numbers circa 35000 BCE, Northern Europe circa 3000 BCE, Egyptian mathematics circa 2000-1800 BCE, Mayan mathematics circa 2000 BCE, Chinese mathematics circa 300 BCE, or Persian mathematics circa 700 CE), calendars, social organization, economic systems, manufactured textiles, wood and stone construction, smelted metals for tools and ornamentation, and organized systematic food and natural resource management systems. Some of this knowledge informs contemporary knowledge systems while much remains in the realm of "knowledge 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, art expressions such as drawing, carving, singing, playing an instrument, dancing, and sculpting. Both expressions have their champions either making distinctions or using them synonymously. While there are distinctions to be made, there is sufficient overlap between the meanings of these and related terms to allow for their interchangeability.

Defining Indigenous Knowledge

While scholars (indigenous and non-indigenous), organizational doctrines, and institutions built a substantial body of literature offering definitions of "indigenous knowledge" a common understanding, much less a definition, has failed to materialize. Depending on the intended use for the definition (scholarly, political, policy, or demographic) authors of definitions have maintained a distance from becoming too specific in an effort to embrace the many different knowledge systems practiced by indigenous peoples.

The Chairman-Rapporteur for most of the existence of the United Nations Working Group on Indigenous Populations (1982-2006) 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 of limited benefit when addressing a specific knowledge system of a specific indigenous people or collection of 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 United Nations Environmental Program (UNEP) combines the broader approach defining indigenous knowledge with recognition of the variety of knowledge systems that existing in different indigenous communities. As a matter of policy the United Nations Environmental Program states it definition this way:

> 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 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 rather narrow indigenous knowledge, confining its meaning to local and environmental topics. Grenier, a Canadian researcher defines indigenous knowledge this way:

> …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 Arce and researcher 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, 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 truly 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 through negotiated exchanges of knowledge and agreeing to the application of agreed knowledge.

Indigenous scholars have taken on the task of defining indigenous knowledge responding to the challenge of the International Council of Scientists Unions (ICS) that takes the position that indigenous knowledge cannot be assembled. The ICSU asserts that such knowledge "differ from scientific knowledge in that it is local, place based, diverse and hence incommensurable and incapable of being validated by common standards." Taking the idea that

indigenous knowledge is diverse and turning that fact to a virtue, Turnbull cites Dei's definition:

> 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. (Die, 2000)

Clash of Cultures

Diana Taylor contends that culture has two parts. The first of these she attributes to thinking of social scientists such as Max Weber and Glifford Geertz. In this view, Taylor suggests, social scientist claim that culture is resilient, persistent and self-identifies. Taylor quotes Geertz as writing: 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 is a viewpoint pervasively held by social scientists generally and gives emphasis to the difficulty of cross-cultural communications. Indigenous and traditional knowledge systems, this view would claim, can express meaning across cultural borders with only great difficulty if at all.

Cuban theorist Fernando Ortíz places culture in a political context where he points to five phases of emergent domination by colonial powers over subject populations. These phases move from a people becoming initially subjugated by a colonizing power when the colonizer denigrates the personality and culture as less than human, and brutish. The second phase Ortíz contends involves "a period of compromise" where the colonizing power softens controls and the colonized "defends himself with his shrewdness and makes clever adjustments based on his mistrust" of the colonizer." (Sierra, 1942) The third, fourth and fifth phases

include “adjustment” where both actors detest one another; the next involves self-assertion by the colonized and the final stage becomes a kind of tolerant mutuality where discrimination remains rampant in the social, economic and political spheres, but despite these prejudices comity seems to be emerging. The process of transculturation as Ortíz’s five phases suggests leads to the fifth phase: the cultures fuse into a new, blended culture.

“Separate and equal” verses “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” or the “dominant” system of knowledge. Closer examination of indigenous knowledge by western scholars and scientists reveal the importance of arranging all knowledge systems on the same plain of importance thereby expanding the global knowledge base on which all human beings can rely 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 long trend of globalization accelerates human contact.

Diversity of Knowledge

Indigenous peoples’ knowledge systems vary from locality to locality, region to region reflecting the cultural distinctiveness for each people resulting from the dynamic and evolving relationship between the people, 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.

Ryser notes in an essay explores different modes of thought throughout history, there are numerous ways of "knowing" that express the knowledge of different peoples. He suggests there are "five different, but related, modes of thought [that] have led to knowing, achieving the ultimate expression of consciousness: apprehending the living universe. (Rÿser, 1998, 19) While there are clearly many culturally animated systems of knowledge, Rÿser credits the Greek, Chinese, Romans, Nubians, Indo-Arians and Mayans for developing "civilization wide" bodies of knowledge. The Greek system of thought based knowledge in observation and *cycles* where 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* is another mode of thinking rooted in the thinking of René Descarte (1596-1650) that bases knowledge on reason, empirical evidence and constant change. The view developed from Descart's time is that knowledge advances toward the *good* (progress) while inevitably relegating what is considered "backward" or primitive to the dustbin of history. Ryser 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 Rÿser calls "progressivism"), which is defined by the Age of Enlightenment

where, “humanism produced a version of human nature by tethering to humanness the requirement of rationality.” (Watson, 2008, 258) Indigenous knowledge must be understood to be equal to western sciences and that the knowledge of indigenous peoples such as that having to do with hunting wildlife for food, for example, must be compared to the knowledge of wildlife biologists and ecologists. Indigenous knowledge systems express concepts and ideas in virtually all domains of western sciences and have over the Ages directly and indirectly informed western science.

Applying Indigenous Knowledge to Modern Challenges

Indigenous knowledge on its own serves individual peoples in localities throughout the world. Faced with significant changes in the environment resulting from human activity and natural changes recognized beginning in the 1960s, economies around the world struggling with water shortages, desertification, soil erosion, forest degradation, social dislocation, ocean and river pollution, international bodies notably led by the United Nations Environmental Program (UNEP) began searching for solutions. Indigenous peoples’ rights was introduced into the United Nations global agenda in the 1970s and by the 1980s the possibility that indigenous peoples’ knowledge may benefit the world’s economies began to be considered in new international treaties and agreements—especially those dealing with the environment, natural resources and climate.

Five years after the United Nations 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 and its emphasis on sharing the benefits of that knowledge 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 the relevant Convention on Biodiversity paragraph Article 8(j) 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. (UN-CBD, 1993, 8(j))

UN member states approved the United Nations Framework on Climate Change Convention (UNFCCC-21 March 1994) establishing a major commitment to document, understand and apply traditional knowledge to reduce the adverse affects of climate change and develop adaptation strategies. The UNFCCC began negotiation of new climate change treaty in 1996 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 United Nations Convention to Combat Desertification (UNCCD-1996) focusing on countries that face significant drought or desertification. The central location for drawing on indigenous knowledge in this arena focuses on Africa, the Middle East and the Mediterranean Sea. A very specific study conducted for the UNCCD centering on traditional knowledge was completed in 1999. The objectives of this Study included, 1. explaining the main attributes of traditional knowledge, develop an inventory of traditional knowledge in the Mediterranean and identify successful approaches, and assess the uses of traditional techniques.

This agreement set in 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 caused researchers at the University of California—Berkeley to eagerly seek access to the knowledge and trees for the purpose of extracting *prosratin*, a drug thought to be beneficial for treating the disease HIV. (Shetty, 2004) Indigenous knowledge about the "sweet plant" used and cultivated by the Guarani people of Paraguay for centuries 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 maintaining healthy teeth, lowering hypertension and balancing flora in the intestines.

Dr. Richard "Umeek" Atleo, hereditary chief of the Nuu-chah-nulth located on Canada's Vancouver's Island, presents his people's perspective on indigenous knowledge as "an integrated and orderly whole, and thereby recognizes the intrinsic relationship between the physical and spiritual realms." (Atleo, 2004) This explanation Atleo derives from listening to, remembering and interpreting origin stories. He regards the Nuu-chah-nulth knowledge system as conceived through the method of "*oosumich,*" (the equivalent of a "vision quest") which joins the physical and the spiritual realms to explain phenomena in life. Since *oosumich* is both a personal and secret method, the possibility of joining it with the western scientific method is problematic, but Atleo believes the Nuu-chah-nulth method of knowledge creation is not inconsistent with the empirical method. As a result, he believes 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 along side the knowledge of other peoples can produce a synthesis that is beneficial to both. That is the

expected outcome offered by representatives of international agencies and non-governmental organizations seeking to support indigenous peoples. The conventional approached of "transferring knowledge" by development agencies such as the United Nations Development Program presumes that one body of knowledge is 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 indigenous fruit trees. Indigenous knowledge about the best selection of trees and growing conditions in dryland areas is critical to the successful propagation. (UNESCO, 1994-2003)

Indigenous knowledge contributes to the reformation of institutions in India's Ajmer District Rajasthan in the village of Silora Block. It is here that the "Barefoot College" was founded to in the style and manner of tradition—different from the introduced educational system offered by the British. The College delivers a curriculum aimed at applying indigenous knowledge and skills to solve problems in the village and the region. The result is that the community develops further its own expertise reducing the people's dependency on outside help that 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 human kind.

Summary

Indigenous knowledge, traditional knowledge and local knowledge are varied ways of labeling the knowledge systems developed and used by more than 6000 indigenous peoples throughout the world. The systems of knowledge are part of the global body of knowledge, but due to historical, political, social and cultural events since the expansion of European, Asian and African peoples throughout the world, 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 not only recognizing indigenous knowledge and equal to other forms of knowledge, but essential to understand and incorporate into the global body of knowledge for the benefit of all human kind.

Author's full name: Rudolph C. RYSER
Center for World Indigenous Studies
www.cwis.org

References

Arce, A., & Fisher, E. (2003). Knowledge Interfaces and Practices of Negotiation: Cases from a Women's Group in Bolivia and an Oil Refinery in Wales. In J. Pottier, A. Bicker & P. Sillitoe (Eds.), Negotiating Local Knowledge, Power and Identity in Development (pp. 74-97). Sterling, VA: Pluto Press.

Atleo, E. R. (2004). *Tsawalk, A Nuu-chah-nulth Worldview*. Vancouver, British Columbia: University of British Columbia Press.

Daes, Erica-Irene A. 1994. Preliminary report of the Special Rapporteur on the protection of the heritage of indigenous people. Document No.E/CN.4/Sub.2/1994/31. Geneva: UN Sub-Commission on Prevention of Discrimination and Protection of Minorities.

Dei, G. S., B. Hall, et al., Eds. (2000). Indigenous Knowledges in Global Contexts: Multiple Readings of Our World. Toronto, University of Toronto Press, 6

Grenier, Louise. (1998) *Working with Indigenous Knowledge: A Guide for Researchers*.

Ellen, R. and Harris, H (1996). "Concepts of indigenous environmental knowledge in scientific and development studies literature - A critical assessment"; draft paper East-West Environmental Linkages Network Workshop 3, Canterbury Ottawa: International Development Research Centre.

Laureano, Pietro. 1999. THE SYSTEM OF TRADITIONAL KNOWLEDGE IN THE MEDITERRANEAN AREA AND ITS CLASSIFICATION WITH REFERENCE TO DIFFERENT SOCIAL GROUPINGS. Matera, Italy: United Nations Convention to Combat Desertification Secretariat.

Shetty, P. (2004, 18 August 2011) Samoa to profit from indigenous knowledge. *SciDev.Net* England and Wales. Retrieved from http://www.scidev.net/en/news/samoa-to-profit-from-indigenous-knowledge-deal.html.

Sierra, J. A. (1942). Fernando Ortíz on the Phases of Transculturation. Retrieved from http://www.historyofcuba.com/history/race/Ortiz-2.htm

Taylor, Diana. 1991. Transculturating Transculturation. *Performing Arts Journal, Inc*. 13 (2):90-104.

Trigo, A. (2000). Shifting Paradigms: From Transculturation to Hybridity: A Theoretical Critique *Unforseeable Americas: Questioning Cultural Hybridity in the Americas* (pp. 85-111). Amsterdam/Atlanta: Rodopi.

Turnbull, D. (2009). "Working with incommensurable knowledge traditions: assemblage, diversity, emergent knowledge, narrativity, performativity, mobility and synergy." Retrieved from: ThoughtMesh. http://thoughtmesh.net/publish/279.php 20 July 2011.

UN-CBD. (1993). Convention on Biological Diversity. United Nations.

UNESCO. 1994-2003. Register of Best Practices on Indigenous Knowledge.United Nations Educaitonal, Scientific and Cultural Organization. http://www.unesco.org/most/bpikreg.htm

United Nations Environmental Programme (UNEP). What Is Indigenous Knowledge? Nairobi: Kenya. Retrieved from: http://www.unep.org/ik/Pages.asp?id=About%20IK on 15 June 2011.

Watson, A., & Huntington, O. H. (2008). They're *here*--I can *feel* them: the epistemic spaces of Indigenous and Western Knowledges. *Social & Cultural Geography, 9*(3).

Further Reading

Digital Library of Indigenous Science Resources **http://www.dlisr.org/**
This is a library collection of documentary resources developed under a grant from the National Science Foundation. The library includes resources in six categories: Climate Change, Education, Law, Sovereignty, Traditional Knowledge and Traditional Foods. The digital library was developed to introduce users to basic concepts.

Clare, M., & Edmo, S. (Eds.). (2008). *Indigenous Ways of Knowing* (Vol. 17). Portland, Oregon: Lews & Clark Graduate School of Education and Counseling.

(2000) Guarani, Shamans of the Forest.
King, Alexander D. (2011) Living with Koryak Traditions, Playing with Culture in Siberia. University of Nebraska Press: Lincoln.

Ryser, Rudolph C. (1998) "Observations on 'Self' and 'Knowing,'" in *Tribal Epistemologies* edited by Helmut Wautischer. Aldershot: Ashgate (1998) pp. 17 – 29

Additional Resources

1. This is an article on establishing an indigenous database:

http://www.cdu.edu.au/centres/ik/pdf/CompDatAbKnow.pdf

2. This article is about recognizing indigenous knowledge as a public good to be documented in order to protect the dignity of the knowledge and to increase understanding:

http://mahidol.academia.edu/JonesMichaelErnest/Papers/72393/Enshrining_Indigenous_Knowledge_as_a_Public_Good_Indigenous_Education_and_the_Maori_Sense_of_Place

3. This article is about how to give appropriate evaluation to measure indigenous knowledge:

http://www.landcareresearch.co.nz/publications/researchpubs/Awatere_Indigenous_Knowledge.pdf

4. This is an example of some documentation of indigenous knowledge:

http://himalaya.socanth.cam.ac.uk/collections/rarebooks/downloads/Maden_Indigenous_Knowledge.pdf

United Nations University Institute of advanced Studies, Traditional Knowledge Initiative

http://www.unutki.org/

The UNU-IAS Traditional Knowledge Initiative seeks to build greater understanding and facilitate awareness of traditional knowledge (TK) to inform action by indigenous peoples, local communities and domestic and international policy makers. Key outputs include research activities, policy studies, capacity development and online learning and dissemination.

5. This is a small collection of indigenous databases:

a. collection of indigenous traditional knowledge sub-saharan africa, summarization of practices: http://www.worldbank.org/afr/ik/datab.htm

b. collection of the best practices on indigenous knowledge: http://www.unesco.org/most/bpikreg.htm

c. this is a law and policy institute designed to empower native peoples by examining the role the law can play in establishing and enhancing indigenous peoples' control over and management of their lands and resources: http://www.iiirm.org/iiirm_home.htm

d. The Arctic Research Consortium of the United States (ARCUS) was formed in 1988 to identify and bring together the distributed human and facilities resources of the Arctic research community-to create a synergy for the Arctic in which each resource, when combined with others, can result in a strength that enables the community to rise to the many challenges facing the Arctic and the United States: http://www.arcus.org/

e. This is the digital branch of a Oral History Program and provides access to audio and video recordings, transcripts, maps, historic photographs and films from across Alaska: http://jukebox.uaf.edu/site/