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Problems of Defining and Validating Traditional Knowledge: A Historical Approach

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Abstract

The United Nations' agencies and many scholars have regarded traditional knowledge as an alternative to science for the purposes of managing the environment. Many countries have adopted this line of approach and formulated some policy strategies. A number of scholars also have engaged in traditional knowledge research and published their works. Despite a large number of publications on traditional knowledge, there seems to be little consensus about the definition of what traditional knowledge is and how it can be useful for environmental management. This article first approaches this definition problem within a historical context in order to clarify the core issues surrounding the definition of traditional knowledge. It then discusses how traditional knowledge can be validated among parties with different interests so that traditional knowledge research and policy can be more effectively implemented in policy-making arenas.

Keywords

traditional knowledge definition, knowledge validation

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Problems of Defining and Validating Traditional Knowledge: A Historical Approach

In the 1980s, topics germane to traditional knowledge captured growing interest among those concerned about environmental problems and agricultural sustainability (Warren, 1989). The reason was partly that scientific and technological advances did not appear to have ameliorated environmental problems (Agrawal, 1995; Brook & McLachlan, 2008). Given the so-called “wicked” or complex nature of environmental issues (Balint, Stewart, Desai, & Walters, 2011), critics emphasized the limited capacity of governments and scientific experts operating within narrow disciplinary confines to fix them (Jamieson, 2003; Ludwig, 2001). The solution, some believed, might be found by adopting ecosystem approaches and the policies of devolution and local government or community empowerment (Karkkainen, 2004; Warren & Issachar, 1983). Some looked to traditional or “old” knowledge that had been sustained for generations in local ecological conditions as yet another alternative to science.

United Nations’ agencies (e.g., United Nations Environment Programme [UNEP], United Nations Development Programme [UNDP], United Nations University-Institute for the Advanced Study of Sustainability [UNU-IAS]) have spearheaded this line of alternative argument in proposing their ideas for sustainable development. When the United Nations’ World Commission on Environment and Development met in the 1980s to discuss the future outlook of sustainable development, it was briefly noted that Indigenous peoples and tribal people “can offer modern societies many lessons in the management of resources in complex forest, mountain, and dry land ecosystems” (World Commission on Environment and Development [WCED], 1987, p. 12). Acknowledging that traditional peoples had experienced political and economic marginalization, it was also stated that “their traditional rights should be recognized and they should be given a decisive voice in formulating policies about resource development in their areas” (WCED, 1987, p. 12).

These points were reiterated in Agenda 21 and the Convention on Biological Diversity in the early 1990s. Chapter 26 of Agenda 21 called for the “involvement of indigenous people and their communities at the national and local levels in resource management and conservation strategies ... to support and review sustainable development strategies” (United Nations Conference on Environment and Development, 1992, 26.3.c). Article 8(j) of the Convention on Biological Diversity promoted the wider application of knowledge, innovations, and practices of Indigenous peoples and local communities to conserve and sustain biological diversity under the proper mechanism of protection from exploitation. In implementing this policy, the signatories of the Convention vows to “respect, preserve and maintain” traditional knowledge, innovations, and

practices. They would also equitably share the benefits arising from the use of traditional knowledge, innovations, and practices (Convention on Biological Diversity, 1992).

This decade also turned out to be particularly fruitful in producing case studies on traditional knowledge in academic journals and popular publications (Agrawal, 1995; Ellen, Parkes & Bicker, 2000; Posey, 1999; Sillitoe, 2000). However, some scholars have become increasingly suspicious about the usefulness of traditional knowledge in dealing with environmental problems (Bohensky & Maru, 2011; Usher, 2000). After decades of discussion and debate over the usefulness of traditional knowledge, scholars could not reach consensus on its definition. Furthermore, few works have given careful consideration to the ways scholars, and Indigenous peoples and local communities have validated traditional knowledge. As I will discuss, many scholars and Indigenous representatives have contributed to this discussion to some extent, but the World Intellectual Property Organization (WIPO), which has devoted much of its activities to dealing with these problems, still acknowledges in its homepage that “there is not yet an accepted definition of TK [traditional knowledge] at the international level” (WIPO, 2015, para. 2).

The purpose of this article, therefore, is to examine some core problems of defining and validating traditional knowledge. This task is important for both scholars, and Indigenous peoples and local communities to begin negotiations for collaborations and partnerships. It is also relevant to environmental policies and Indigenous policies in general as the vague understanding of these definition and validation problems has led policymakers and scholars to heavily rely on the personal assumption of what the definition of traditional knowledge is supposed to be and how traditional knowledge should be validated. WIPO and other organizations do provide their working definition of traditional knowledge, but, after examining a large number of scholarly articles on traditional knowledge, I still find it important that we examine these definition and validation problems in this special issue, “The Future of Traditional Knowledge.” As this issue strives to establish partnerships between Indigenous peoples and local knowledge holders, and scholars and policymakers, it is essential that all stakeholders can recognize some pitfalls they may fall into in attempting to obtain mutual understanding about the validity of traditional knowledge.

As the scope of this article is very broad, some scholars have suggested adopting the specialized or compartmentalized definition of traditional knowledge: for example, by focusing only on traditional ecological knowledge or any specific type of knowledge. However, after working with Indigenous knowledge holders for more than 25 years, I argue that traditional knowledge cannot be simply compartmentalized by academic disciplinary categories. Indigenous and traditional ecological knowledge, for example, can be interrelated with religious and spiritual knowledge as well as rights to

land, harvesting, and cultural practices at large. We need to grasp traditional knowledge within an interdisciplinary and interconnected context to better understand the problems of defining and validating traditional knowledge. In this sense, I largely agree with the working definition of traditional knowledge by WIPO that encompasses not only ecological knowledge but also other types of traditional cultural expressions. Currently, it defines traditional knowledge as “knowledge, know-how, skills and practices that are developed, sustained and passed on from generation to generation within a community, often forming part of its cultural or spiritual identity” (WIPO, 2015, para. 1).

In the process of tracing the history of defining and validating traditional knowledge among scholars and others, this article attempts to examine two open-ended questions: First, what is the definition of traditional knowledge? Second, how can one validate traditional knowledge? Examining these questions is important to clarify the ethical and legal implications of collecting, using, publishing, or commercializing traditional knowledge. This point is important partly because, as I argue, debates over the usefulness of traditional knowledge have been largely affected by the lack of in-depth understanding about what constitutes “tradition” and “knowledge.” In policy implementations, these questions also have affected traditional knowledge holders who want to maintain control over their own knowledge and protect it from exploitation or misappropriation by researchers and business speculators. Finally, my investigation of these questions leads to the recognition of one neglected but salient aspect in previous traditional knowledge discussions: A clearer definition of traditional knowledge can help us better understand the scope of Indigenous rights and governance.

Problems of Definition

The most contested aspect of the definition of traditional knowledge is related to how scholars and others have perceived “tradition.” Many Australian anthropologists who are experts on Aboriginal cultures have persistently argued that the term traditional knowledge is archaic or obsolete (Anderson, 2009). It is not, they claim, relevant to the contemporary knowledge Aboriginal people hold. Partly because of this concern, they have proposed to abandon the term “traditional knowledge” and instead use “Indigenous knowledge.” For example, Jane Anderson (2009), a legal scholar on Aboriginal intellectual property rights, contends,

The insistence on the “traditional” as the key marker of difference obscures contemporary indigenous practice and the reality that indigenous knowledge also undergoes transformation overtime in usage and circulation both within family or community contexts and/or between families, the community and external parties. (p. 11)

For Anderson, the term “traditional” evokes a romanticized notion whereas the term “Indigenous” does not.

Australian scholars are not only the ones to claim that term “tradition” is archaic or obsolete and reifies Indigenous knowledge production. For a long time, this understanding has been shared by those—in the fields of literature, politics, philosophy, and other genres—who have argued that scientific knowledge and modernity are antithetical to traditions. Two major ideas have evolved here (although these two are not entirely separable).¹ Similar to the proposals of Alexander Hamilton, Adam Ferguson, Max Weber, and John Miller, the first idea celebrated the advancement of industry, scientific knowledge, modernity, and economic efficiency (Shils, 1981). As Thomas Hobbes (1651/1909) expressed in *Leviathan*, this group also identified traditional societies as feudalistic, undemocratic, primitive, or savage. According to Clifford Davidson, even hostility and impatience for tradition developed among a certain group of intellectuals (Davidson, 1992). The other group, represented by J. Hector St. John Crevecoeur, Thomas Jefferson, and Francis Parkman, yearned for yeoman ideals and deplored the negative ramifications of mechanization and urbanization, such as poverty, crimes, and other social problems (Matsui, 2009). They romanticized traditional societies like those of Native Americans as simple, innocent, but ecologically ideal. Both approaches were essentially based on the assumption that “traditional” is antithetical to modernity (Bendix, 1967).

From the late nineteenth century to the early twentieth, cultural and social anthropologists popularized the notion of traditional culture and society as something old, pre-modern, primitive, and static. In general, anthropologists at this time did not use the term “traditional” in describing “primitive” people, but their studies of them have strongly influenced the discussion of contemporary scholars. Edward B. Tylor’s *Primitive Culture* (1871) laid the foundation for later anthropologists to conduct research among “primitive” cultures as a way to understand the early stage of human society. Tyler (1871) proposed that

The savage state in some measure represents an early condition of mankind, out of which the higher culture has gradually been developed or evolved, by processes still in regular operation as of old, the result showing that, on the whole, progress has far prevailed over relapse. (p. 28)

¹ It is important to acknowledge that some critics were ambivalent about both the destruction of tradition and the dominance of modernity. Walter Benjamin’s writings show this ambivalence (McCole, 1993).

He then explains how mythology, language, and other cultural elements may help anthropologists better understand the “primitive” stages of culture. In doing so, Tylor did not pay much attention to historical changes or continuities in “primitive” cultural elements.

In the early twentieth century, the methods of field work and direct observation became standard practice and gave scientific characteristics to anthropological works.² In doing so, anthropologists adopted Tylor’s approach and continued to treat cultural and traditional elements as something frozen in time. For example, Bronislaw Malinowski, Raymond Firth, and A. F. Radcliffe-Brown ventured into the remote islands of the Oceania. Radcliffe-Brown also published influential works on Australian Aboriginal society, which later laid the foundation for social anthropologists in Australia. They chose these areas because they had perceived them to be typically “primitive” and least influenced by civilizations.³ What Malinowski postulated on culture as a result of years of fieldwork did not leave much room to consider historical changes in society. Radcliffe-Brown dichotomized science and history and regarded the latter as unverifiable speculation or illusion of explanation (Kroeber, 1952). Malinowski and Radcliffe-Brown theoretically opposed each other in advocating their theories of “primitive” society, but both presented their studies with little consideration of historical change (Radcliffe-Brown, 1949).

A group of prominent American cultural anthropologists such as Franz Boas, Alfred Kroeber, Ruth Benedict, and Julian Steward examined various cultural groups in North America to identify patterns of culture or cultural ecology (Moore, 2009). In theorizing ethnographical data, Boas (Boas, 1911/1938) and Benedict (Benedict, 1934/1961) attempted to characterize cultural patterns and behaviors to understand what they called “culture-wholes.” On this point of picturing the entire culture, Kroeber began to distance himself from Boas and Benedict by emphasizing the importance of considering historical contexts. In his *Nature of Culture*, Kroeber (1952) advocated to extend Benedict’s static theory of a whole culture by adding historical depth. In doing so, he emphasized stylistic features and identified historic “configurations” of a culture (see also Steward, 1962). Boas later acknowledged the growing trend of historicizing anthropology, but he still sided with Benedict, who primarily examined the socio-psychological aspects of culture (Benedict, 1934/1961). Nevertheless, it was largely a historical model for studying “primitive” culture and society that shaped the ways anthropologists understood “traditional” society and knowledge in the late twentieth century (Peterson, 2010).

² Alfred Kroeber (1952), for example, regarded studies of culture as part of the natural sciences.

³ In describing the scale of civilization, Tylor (1871) wrote, “Few would dispute that the following races are arranged rightly in order of culture—Australia, Tahitian, Aztec, Chinese, Italian” (p. 24).

There is another notable aspect of anthropological and ethnographical works from the early twentieth century. In collecting and recording knowledge in Indigenous societies, many studies omitted, for example, commercial trading activities and the ownership of land and intellectual properties. Part of the reason was that most anthropologists believed that “primitive” peoples, who were supposedly living in communal, egalitarian, and simple societies, did not have the idea of commerce, division of labor, or law. Although Malinowski (1926) did recognize the existence of “primitive” law among the Trobriand Islanders in *Crime and Custom in Savage Society*, he nevertheless portrayed the islanders as lacking the authority to enforce it. Their understanding of individual rights was similarly unstructured. The principle of communal reciprocity dominated much of their activities and behaviors (Conley & O’Barr, 2002). This recognition of law in “primitive” society was met with criticism by anthropologists like Radcliffe-Brown (1949) and William Seagle. Seagle (1937) argued that Malinowski’s use of the term “law” stretched its definition. For him, the law existed in a society with political and legal organizations that enforce written codes. He argued that the islanders in Malinowski’s descriptions had customs but not law.

After the 1950s, however, a group of anthropologists, sociologists, and theologians began expressing their opposition to the antinomy of tradition and the modern. Sociologist Reinhard Bendix (1967), for example, examined modern European societies and emphasized the continuity of some traditional elements in these societies before and after the industrial revolution and the French revolution. He said,

In most European countries there is evidence rather of the continued social and political pre-eminence of pre-industrial ruling groups even when their economic fortunes declined, as well as of the continued, subordinate social and political role of the ‘middle class’ even when their economic fortunes rose. (p. 338)

Some of the binding elements between the pre-modern and the modern also included kinship ties, religious beliefs, linguistic affiliations, and territorial communalism. Bendix (1967) also reminded the reader that “modern” elements existed long before the so-called modern era.

Clifford Davidson (1992), a literary critic who studied theatrical traditions in Western societies, similarly emphasized the continuity from pre-modern to modern periods. For example, he explained that some typical modern technological advances derive their foundation from the accumulation of knowledge, innovations, and practices from the pre-modern period. For example, the technology of building automobiles became possible only after the pre-modern inventions of not just the wheel, but also the moveable front axle and the four-wheeled wagon. In a similar vein, the computer is the

result of thousands of years of development in mathematics as well as the technology of using electricity.

Another prominent sociologist Edward Shils (1981) in his book, *Tradition*, also emphasized the continuity of pre-modern European traditions in the modern period, including scientific and intellectual ones. For Shils, traditions are associated with beliefs, including knowledge, that have been passed through generations. The substance of traditions can be transmitted not only orally but also through texts, symbols, and other objects. This point gave him enough reason to investigate traditional elements in scientific and intellectual societies. He contended that both scientists and traditional people developed ideas on the basis of what was established in the past even though they used different processes to acquire them. Much of what a scientist produces is based on what his or her colleagues in the same traditional discipline have written about. This means that a scientist “confirms his confidence in the reliability of the scientific community and it thereby sustains his morale as a scientist and his confidence in the integrity of the scientific enterprise” (Shils, 1981, p. 113). This point resonates what Thomas S. Kuhn (1962) earlier pointed out about the progress of science as a product of the accumulated knowledge development.

Shils (1981) also argued that traditions are not frozen in time; instead, they evolve by adapting to changes. He said, “The rules which survive as tradition are those which have made the most successful adaptations to changes in the environment; they have shown their efficacy” (p. 205). These changes come from both endogenous and exogenous sources. Traditions exist within a person, community, or nation. Traditions, through changes, have to be “routinized” by people, and this process normally takes “three generations” to be accomplished. Shils did not clarify why he set out this minimum requirement to validate traditionality of a tradition, but he did acknowledge that the length of one generation is difficult to determine.

In a study of Madras in India, anthropologist Milton Singer (1971) reiterated some of Shils’ points by examining how traditional Madras society responded to modernity. Like Shils, he did not believe that tradition and modernity are antithetical; rather, for Singer, modernity existed within traditions. He contended that modernity was “a permanent layer or dimension of indigenous culture and not simply a collection of recent foreign imports or the fashionable life-style of a privileged class” (Singer, 1971, p. 175). Singer showed how Madras society incorporated “modern” elements into its traditional “cultural protoplasm.” When the new and the foreign are introduced, Madras society first compartmentalized it in what he called a “cultural enclave.” Then the compartmentalized new or foreign was selectively integrated into Indigenous traditions, slowly diluting the alien aspects of the new or the foreign (Singer, 1971). In order for the new to become fully validated as traditional,

according to Singer, it had to become “old,” conform to customary or scriptural norms, and have an origin myth, in which it is linked to a great traditional set of ancestors or precedents. In Madras society, tradition also was connected to morality, enabling some to claim ancient affiliation and help validate one’s present status in society (Singer, 1971). Shils (1981) also similarly argued that traditions provide guiding principles to good governance of a society.

In the 1980s, post-modern interpretations entered the discussion. A new generation of scholars agreed that tradition is not something frozen in the past: it is not archaic or obsolete. Rather, tradition commands one’s consciousness in the present. Anthropologist Jocelyn Linnekin (1983) argued that: “the selection of what constitutes tradition is always made in the present. Tradition is somewhat associated with the past, but this ‘past’ is equivocal: it does not correspond to the experience of any particular generation” (p. 241). Terrence Tilley (2006) in religious studies even goes further and argues that “traditions are simply not found” (p. 252) because traditions “are neither fixed nor given, but in some ways fluid and made up by the participants” (p. 247). For theologian Kathryn Tanner (2006), “tradition is invented rather than found because it is a matter of human attribution” (p. 237). These interpretations met criticism from anthropologists like Marshal Sahlins (1993), who warned that the overemphasis on the presentness and constant changes of traditions slight the fact that some cultural elements do persist and continue through time.

Beginning in the 1970s (especially the 1990s), Indigenous writers joined the discussion and clarified their perceptions of tradition. Historian Donald Fixico (2003), for example, emphasized the circular notion of time and space in discussing traditional knowledge of Native Americans—that is, the past, the present, and the future are not clearly separable. Traditions and traditional knowledge also evolved as traditional people selectively incorporated something new and foreign. These points sound somewhat similar to what post-modernists have said of tradition, but for Fixico and others traditions do exist in a historical or circular context and interact with both one’s consciousness and external worlds. Native American writer, Thomas King (2003), similarly emphasized the culturally persistent notion of traditional worldviews and wisdom that exist both within one’s consciousness and communal commons. In other words, traditional knowledge and wisdom in many Indigenous societies have developed by taking endogenous and exogenous influences. Also, as anthropologist Keith Basso (1996) pointed out in his *Wisdom Sits in Places*, Indigenous knowledge and wisdom are situational or location specific and interconnected with stories of the past with the present and future ramifications.

According to Indigenous authors, Indigenous peoples transmit their traditions through traditional ways of knowing, most typically through narratives. Narratives are enhanced through seeing some

landscapes and places and carved and painted objects (Basso, 1996). Fixico (2003) said, “seeing and understanding things in a visual context is the basis of receiving information or the processing of information” (p. 6). In Canada, some First Nations peoples (e.g., Haida, Gitksan, and Tsimshian) on the West Coast of British Columbia have carved totem poles that enhanced and visualized family or community history. Similar to the points Milton Singer (1971) made regarding Madras society, storytellers in Haida and Kwakwak’waku societies told and retold stories and origin myths that connected people in the present to the past. By doing so, storytellers reasserted their status of being properly connected to the past. The history that is engraved in totem poles includes not only human relations, but also relations between human and non-human ancestors as well as supernatural beings. Various traditional social events in the northwest coastal regions of North America often offer venues to the transmission of knowledge and wisdom. The narratives that are presented in these events sometimes clarify the territorial boundaries of the family or community (Mills, 1994). These narratives and performances are usually witnessed and validated by both communal members and non-communal members (Bringhurst, 2011).

Indigenous peoples’ writings also serve to convey traditions to non-Native audiences. Fixico (2003), King (2003), Deloria (1973), and other Native American writers commonly emphasize that traditional people and Western scientists or religious people acquire and transmit knowledge in fundamentally different ways. In his controversial book⁴ on traditional knowledge, *the American Indian Mind in a Linear World*, Fixico (2003) frequently discusses his personal observation of the very different perspectives that he and non-Native people held. Recollecting his grade school days, for example, he says, “I often wondered why I thought in a different way than my classmates, and why I did things differently from a mental point of view” (Fixico, 2003, p. xi). Throughout his book, he attempts to clarify the differences of Native worldviews from linear Western scientific views of the world.

In fact, many Native leaders have expressed similar sentiment as early as the early twentieth century (Matsui, 2009). One of the reasons for emphasizing the differences was that traditional knowledge holders did not appreciate the linear ways of managing environmental matters. Anthropologist D. Michael Warren (1989) found that in developing countries educated individuals began to challenge Western scientific control over environmental management in their nations. Although some non-Indigenous critics challenged the essentialized notion of Indigenous–European cultural dichotomy, especially concerning the portrayal of Indigenous peoples as ecologists (Krech, 1999),

⁴ Historian Frederick E. Hoxie criticized Fixico’s discussion about essentializing Native behaviors and minds (Hoxie, 2000).

Marshall Sahlins (1993) and others look at this phenomenon as part of natural cultural responses. Sahlins sees the claim of “ecological” Natives as the emergence of the “proxy critics of Western society” rather than the creation or invention of myths. The process of essentializing traditionality is also akin to the self-conscious effort to establish a “differentiated cultural space” (pp. 19-20). Legal scholar Karen Engle (2010) also observed a similar phenomenon in her book about the Indigenous movement in the Americas after the 1970s. She recognized that the Indigenous peoples were not naïve about claiming differences. She instead treated the phenomenon as “strategic essentialism,” with which Native peoples attempted to advance their status in a political and legal arena.

In the midst of rising political power among Indigenous peoples, non-Native scholars revisited the definition of traditional societies. In discussing the potential use of traditional knowledge in environmental governance, these scholars separated the notion of tradition from modernity by corresponding with the “differentiated cultural space” expressed by Indigenous writers. For example, in promoting Indigenous knowledge, anthropologist Stephen Brush (1996), defined Indigenous knowledge as “the systematic information that remains in the informal sector, usually unwritten and preserved in oral tradition rather than text” (p. 4). Ecologists Fikret Berkes, Johan Colding, and Carl Folke (2000) similarly believed that traditional ecological knowledge is a way of knowing that exists in “nonindustrial or less technologically advanced societies, many but not all of them indigenous or tribal” (p. 1252). In their influential definition, traditional ecological knowledge is “a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” (p. 1252). Here Berkes and others were careful not to treat traditional knowledge as something archaic or static. They also emphasized the evolving and adapting aspects of knowledge transmission among traditional knowledge holders (Butler, 2006).

However, Berkes’ definition and its analogs do not include space for innovation, whereas the Convention on Biological Diversity (1992) recognizes it as integral to Indigenous and local cultural expressions. Most scholarly definitions, Berkes’ included, do not pay much heed to international legal discussion about traditional knowledge. For example, the working definition of the WIPO, which was released in 2007, sounds more broad and inclusive than the ones discussed above. Article 3(2) of the WIPO statement reads that traditional knowledge is:

... the content or substance of knowledge resulting from intellectual activity in a traditional context, and includes the know-how, skills, innovations, practices and learning that form part of traditional knowledge systems, and knowledge embodying traditional lifestyles of indigenous and local communities, or contained in codified knowledge systems passed

between generations. It is not limited to any specific technical field, and may include agricultural, environmental and medicinal knowledge, and knowledge associated with genetic resources. (cited in Antons, 2009, p. 2)

This WIPO definition acknowledges that the substance of tradition includes not only knowledge but also skills, innovations, practices, and learning. Here the types of knowledge are varied, whereas Berkes, Colding, and Folke only acknowledge oral and “nonindustrial” forms of knowledge.

The discrepancy in the definition of traditional knowledge between the WIPO and those in academic works can be attributed to different reasons for defining the term. Berkes, Colding and Folke wrote their articles on the premise of using traditional ecological knowledge for environmental management. The definition of traditional knowledge in the WIPO statement and the Convention on Biodiversity took shape because drafters were interested in promoting, not only the use of traditional knowledge, but also its protection from the overexploitation and misappropriation by scholars and the corporate sector. As mentioned elsewhere (Matsui, 2012), national legal systems in Canada, for example, established traditional knowledge policy for conservation purposes. But they did not develop laws to protect the knowledge, innovations, and practices of Indigenous peoples and local communities. It is also important to note that the issues related to biodiversity and the traditional ecological knowledge of Indigenous peoples are not regarded as an integral part of Indigenous rights and governance.

Problems of Validation

In promoting the use of traditional knowledge, Berkes and others have faced suspicion and criticism from some scholars about its usefulness. Frances Widdowson and Albert Howard (2008), former traditional knowledge consultants in Canada, are arguably the most vocal skeptics about the use of traditional knowledge in environmental management. In their book, *Disrobing the Aboriginal Industry*, they contend that Indigenous peoples’ ecological observation is “junk science” (p. 242). Some ideas that are derived from Indigenous observation or expression, they conclude, require scientific testing before they are accepted as knowledge. For them, knowledge represents rationality and empirically tested ways of knowing, and Indigenous peoples’ ways of knowing do not conform to this category. Ultimately, they argue that there is no way traditional knowledge can be validated with scientific knowledge because these two knowledge systems are fundamentally different (Widdowson & Howard, 2008).

Berkes, Colding, and Folke (2000) similarly emphasize fundamental differences between traditional and scientific ways of knowing, but they still believe that some types, if not all, of traditional knowledge are compatible with scientific knowledge. However, they make a cautious statement that the traditional knowledge system does not always convey ecologically wise information to ecologists, and, therefore, “traditional ecological wisdom requires a reality check” (Berkes et al., 2000, p. 1260). Peter Usher (2000), historical geographer and consultant in Canada, similarly recommends in his study on traditional knowledge policy in northern Canada that scientists validate certain types of traditional knowledge Indigenous peoples possess, especially concerning the knowledge related to the observation and uses of natural resources.

Other scholars express suspicion about the possibility of “validating” traditional knowledge by scientists. Philosophers and scientists have argued that validation, which denotes the recognition of legitimacy, cannot be logically established in scientific models, which may be found only temporarily plausible. They believe that the scientific processes of validation or verification leave out many uncertainties, and, no matter how plausible, once-validated findings can still be contested later by other scientific observations. Ultimately, scientific models cannot validate or verify what is real in the environment (Oreskes, Shrader-Frechette & Belitz, 1994). So far, anthropologists, not natural scientists, have discussed the methods of validating cultural knowledge (Broom & Kitsuse, 1955; Handwerker, 2002). If natural scientists were to validate traditional knowledge and wisdom, as Berkes and Usher suggest, there is no other theoretical support than anthropological works to establish the scientific criteria of intercultural knowledge validation. Then the questions arise: Is this interdisciplinary validation effort by both anthropologists and natural scientists possible and workable? Or given that validating traditional knowledge by scientists is possible, what are the scientific criteria to do so? So far, we do not have any scientific theory or model that could help answer these questions.

Instead of exploring the possibility of validating traditional knowledge, some scholars have argued that attempting the unilateral validation of traditional knowledge by scientists and other scholars poses the risk of disempowering knowledge holders and marginalizing traditional societies. Also, giving the authority to government-hired scientists to legitimize traditional knowledge could be regarded as another form of colonization (Butler, 2006). Others added that validation from Western knowledge systems is not necessary as traditional knowledge itself holds its own intrinsic value in environmental governance. Christoph Antons (2009), legal expert on traditional knowledge in Asia, argued that traditional knowledge “should not be interpreted as limiting or seeking externally to define the diverse and holistic conceptions of knowledge within the traditional context” (p. 2).

One study on fish management in Australia, however, provides a window into Indigenous peoples' perspectives on this question. The researchers in this study asked Aboriginal people if the scientific validation of their Indigenous knowledge on fish was disrespectful to them. The result of their interview showed that Aboriginal people, both co-researchers and elders, were generally positive about the validation process because, once validated by scientists, their knowledge would become legitimized in mainstream society. The researchers also found that the validation process may improve the mutual understanding of each other's value systems that eventually may lead to the better collaborative relationships between Aboriginal communities and researchers. They believe that promoting mutual cross-cultural understanding through the validation process can lead to a change of social values in natural resource use activities, which embraces both Indigenous and scientific views (Gratani et al., 2011).

Anthropologist Paul Nadasdy's (2006) study on the traditional ecological knowledge policy in Yukon, Canada, however, shows strained and frustrated relationships that developed after some years of "cooperation" between Indigenous knowledge holders and scientists in wild game management. The government policy was laid out under the premise of "trust" and "co-management," but biologists and Indigenous peoples developed their arguments by using their own sources of information without much exchange. Nadasdy (2006) observed that "the integration of science and TEK is hampered by the difficulty of collecting TEK and by qualitative differences in the form of scientific versus traditional or local knowledge" (p. 129).

Similar adversarial relationships developed in court after some effort for cross-cultural communication. Since the 1970s, as Arthur J. Ray details in this special issue, an increasing number of Native traditional knowledge holders have testified in court and revealed their knowledge about traditional land use and harvesting activities. The legal process has improved the understanding of Indigenous rights, but it has also strained cross-cultural relations (Ray, 2003; Ray, 2010; Thuen, 2004). For example, during the land title case of the Gitksan and Wet'suwet'en in northern British Columbia, which began in the 1980s and lasted until the 1990s, Alan McEachern, the trial judge, heard voluminous testimonies by Native elders and academics. The elders and chiefs of the Gitksan and Wet'suwet'en decided to share their knowledge in court with the good intention of educating and creating better cross-cultural relationships (Monet, 1991). In rendering his decision, McEachern dismissed all oral testimonies by elders as hearsay. He stated, "to quote Hobbs [*sic*], aboriginal life in the [Gitksan-Wet'suwet'en] territory was, at best, 'nasty, brutish and short'" (cited in Ridington, 1992, p. 18). However, according to his interpretation, this "primitive" state of the Gitksan and Wet'suwet'en people faded away when they moved away, at least partially, from

trapping and hunting occupations by participating in a cash economy. This erosion of traditionality among Native witnesses made their testimonies less authentic. In addition, McEachern regarded the Native origin story and other historical evidence as fallacy. For example, he found the story that emphasized that their ancestral root in their traditional territory “not true” because it did not conform to the available archaeological studies (Ridington, 1992, pp. 18-19).

McEachern’s judgment is one of the most extreme versions of skepticism that does not recognize the validity and authenticity of traditional knowledge that is expressed in the present context. Also, McEachern’s perception of Native testimonies and their traditional life challenged the authority of traditional chiefs and humiliated many Native witnesses, who took the risk of revealing in court the knowledge that was not supposed to be shared to outsiders and then paying the price. Elders did not expect that the court would validate the knowledge they presented, either. They meant to share the knowledge so that the court would have a better understanding of their ancestral connection to their traditional territory (Monet, 1991). In McEachern’s decision, even expert witness reports by renowned cultural anthropologists were almost entirely dismissed as he found the reports politically biased because those anthropologists conducted research and wrote their reports on behalf of Native peoples (Culhane, 1998; Ray, 2011; Ridington, 1992). The report of one historian, who had not had contact with Native peoples and whose analysis was based solely on archival documents was admitted as evidence (Ray, 1991). The outright dismissal of Native testimonies and anthropological evidence was later reversed by the Supreme Court of Canada, which deemed Native testimonies as valid evidence (*Delgamuukw v. B.C.*, 1997).

More recently, the protection of traditional knowledge against bio-piracy has also posed legal and ethical questions (Balick, 2007; De Carvalho, 2007; Mackey & Liang, 2012; Oguamanam, 2006; Sarmiento, 2009;) and cultural appropriation (Brown, 2003; Coombe, 1998; Tsosie, 2002; Young, 2010). Pharmaceutical companies or agro-biological institutions have located specific traditional knowledge that is related to the medicinal quality or genetic diversity of plant species and varieties. Once placed in a laboratory setting, the collected sample can be developed into a pharmaceutical product, a plant variety or genetically modified organisms with patent without paying the original knowledge providers any royalty (King, Carlson, & Moran, 1996). In this process, scientists often validated the usefulness of the knowledge of Indigenous peoples and local communities in their own value systems. But neither this knowledge nor the people who produced it gained meaningful recognition (Curci, 2010; De Carvalho, 2007).

Much of legal and ethical discussion so far to prevent these appropriation practices has focused on the protection of rights for Indigenous peoples and local communities to cultural and spiritual

activities, land, and natural resources. This discussion, however, has not yet clarified how scholars and policymakers recognize the validity of traditional knowledge in implementing basic principles for collaborations and partnerships. Numerous ongoing cases of commercializing Indigenous and ethnic cultural objects and symbols in popular culture, businesses and activities such as movies, plays, literature, and tourism (Brown, 2003; Matsui, 2013) testify to the limit of current ethical principles and legal frameworks to fully acknowledge the knowledge of Indigenous peoples and local communities. The WIPO, various other United Nations' agencies (e.g., UNESCO, UNEP, UNDP, UNU-IAS), and legal experts have extensively discussed the extent to which Indigenous peoples and ethnic communities can be protected from these problems by revising international intellectual property law (Oguamanam, 2006) or revisiting the concept of cultural rights (Alderman, 2008; Carpenter, Katyal, & Riley, 2009; Carpenter, Katyal, & Riley, 2010). The result was partly shown in the refined definitions of traditional knowledge in Article 8(j) of the Convention of Biological Diversity (1992) and the WIPO draft document of 2007 (see WIPO, 2008). In discussing these legal implications of using traditional knowledge, many legal experts expressed the need to establish dispute resolution mechanisms in both legal and ethical areas. In fact, as I discussed elsewhere (Matsui, 2012), in the latter half of the twentieth century, scholars and international organizations have established many non-legal or ethical principles to provide a better protection to traditional knowledge holders from biopiracy and cultural appropriation (Bannister, 2009). Various academic organizations, such as the International Society of Ethnobiology (ISE), the American Anthropological Association, and numerous other academic organizations, followed by refining and improving the contents of their ethical principles.

Other than these rights-based approaches to the validation of traditional knowledge, what is missing is the ethical approach that guides scholars and policymakers to understand the validity of Indigenous and traditional knowledge in culturally sensitive manners. For example, the Code of Ethics for the members of the ISE, which is regarded one of the most dedicated and detailed ethical codes to date in protecting rights of Indigenous peoples and local communities, is surprisingly silent about how ethnobiologists may recognize the validity of traditional knowledge. Along with several other codes of ethics, the ISE Code does promote respect for the Indigenous knowledge system and relevant research; yet, it is not yet clear how, for example, a young, inexperienced scholar can recognize the validity and value of traditional knowledge in conducting research among Indigenous peoples. In fact, this aspect of validation is the weakness of many academic communities today. Studies on organizational knowledge sharing and validation processes have only recently emerged. One study on knowledge sharing and management found that the criteria of validating knowledge in a narrative are normally implicitly applied through the action of knowledge transmission without any

conscious reflections (Geiger & Schreyögg, 2012). This implicit knowledge sharing, I argue, has affected the ways scholars have discussed the definition and validation of traditional knowledge. The implicit nature of knowledge validation poses some challenges for many scholars in their attempts to understand other culture's implicit knowledge validation processes. And the extent to which ethical principles and law can guide scholars and policymakers to better understand knowledge validation as cultural process can help shape more cross-culturally sensitive research ethics guidelines in the future.

Conclusion

Given the adversarial conditions of recent cross-cultural debates over the definition and validation of traditional knowledge, the question is: How can scholars, politicians, Indigenous peoples, local communities, and international organizations agree on how to define and validate traditional knowledge? In this article, I have clarified the problems that have risen from defining and validating traditional knowledge. The discussion above should help us better understand some problem areas in defining and validating traditional knowledge.

However, there are still other problem areas that cannot be clearly answered. We must still connect traditional knowledge issues to those of Indigenous peoples' governance and sovereignty. In implementing traditional knowledge policy for biodiversity conservation and environmental assessment, Canada, for example, has promoted the policy implementation mechanism of stewardship, in which local people can be active participants in planning, executing, and evaluating environmental management measures (Matsui, 2012). Although Indigenous peoples are included in this process, their *sui generis* rights as Indigenous peoples and their sovereignty in their traditional territories have not gained much attention. This may sound strange if one understands the existence of the traditional knowledge of Indigenous peoples within locally specific environmental settings. While there is much discussion about the extent to which Indigenous peoples have rights to their land and resources, we do not yet have a clear idea about how the protection of traditional knowledge can be part of Indigenous rights. Ultimately, we must grapple with the question of whether Indigenous peoples should have governing rights to biodiversity and natural resources in general.

In connection to the issue of Indigenous rights and sovereignty, the questions of definition and validation also require the establishment of better cross-cultural processes for reconciliation in building trust for collaborations and partnerships in scientific, artistic, and business endeavours. For this, more political scientists, legal scholars, historians, and anthropologists, among others, can

contribute to an in-depth understanding of how Indigenous peoples and local communities have historically defined, validated, and managed environmental knowledge within their communities. The findings of these studies should be able to help establish reconciliation processes by creating new value.

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