

The Value of Subsistence for the Future of the World

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Documenting traditional ecological knowledge has become a growing concern in recent years. The acronym TEK, which stands for "traditional environmental knowledge" (Williams and Baines 1993), is popular, as is IK, "indigenous knowledge" (Brokensha et al. 1980; Cunningham 1991; Warren et al. 1991); others prefer the label "local environmental knowledge." More recently "ethnoecology" has been emphasized (Toledo 1992). The profusion of acronyms and competing headings suggests the rapid emergence of this perspective from within several independent academic networks.

Such bodies of traditional knowledge are gravely threatened, in imminent danger of going to the grave with the present generation of elders. One could play devil's advocate and argue that today's world is a very different world than that with which these elders learned to deal; that their traditional knowledge is thus obsolete; and that new sorts of knowledge will better serve present and future generations. In particular, it might be asserted that Western scientific knowledge in such fields as biochemistry, global biogeography, and evolutionary ecology will suffice to guarantee our future. Given that cultural knowledge is dynamic and must change in response to changing requirements for survival and success, how can we justify devoting substantial time, effort, and resources to the task of preserving traditional environmental knowledge?

Three Reasons to Preserve TEK

TEK is both local and fragile. That TEK is local rather than global in scope is a consequence of the context of its acquisition, transmission, and use. It is acquired via direct personal experience, is transmitted orally within a commu-

nity, and is validated by its relevance to the daily struggle to wrest a livelihood from one's land.

It is fragile because it is local. Knowledge common to one community is specific to its immediate environment and will not be shared widely in other communities. Thus that particular body of knowledge lives and dies with the community that sustains it, and that it in turn sustains. A corollary is that the value of TEK is additive across the world's cultures. Nevertheless, many formal characteristics of such cultural knowledge systems may be widespread or universal, reflecting the psychic and experiential unities of humankind (Berlin 1992). Thus, preserving even the essential features of a few such systems may inform us deeply about our common humanity.

By contrast, Western science strives for universal relevance and global scope. Western scientific research findings are published, recorded in a form that is both permanent and accessible to the scrutiny of any person in the world with the means and motive to consult that record. The local nature of TEK is both a weakness and a strength. Local knowledge systems are less likely than global systems to support powerfully general theories. However, local environmental knowledge systems have proved in many cases to provide a description of local environments superior in detail and coherence to that of Western biological science (Diamond 1966; Hunn and French 1981; Johannes 1981; Jones and Konner 1976; Nations and Nigh 1980). Such systems are grounded in lifetimes of intimate daily observation, a luxury not available to the vast majority of professional Western biologists.

If it be granted that TEK is fundamentally sound as science (Hunn 1993), then TEK complements the findings of Western science rather than being superseded by them. In that case, it is well worth the effort to preserve such systems as far as is now possible as part of the published scientific record.

So far, our justification for preserving TEK has focused on the value of the information such systems of knowledge may contain; how they may augment the corpus of available scientific data. That certainly is the thrust of the popular promotion of ethnobotany by Mark Plotkin (1993) and others (such as Arvigo and Balick 1993; Cox and Balick 1994; and Schultes 1990). From this perspective, TEK should be preserved as a potential source of information that may lead to the development of new cancer treatments, new disease-resistant crop varieties, or renewable and biodegradable substitutes for the materials currently required to drive our industrial technologies (Head and Heinzman 1990; Nabhan 1985, 1989). In such cases TEK is but one input into a modern scientific process intended to prop up the contemporary global status quo. Ethical

concerns have with good reason been raised about such "technology transfers" in reverse (Martin 1995:239-46; Posey 1983) as exploiting TEK to support a global system that is deeply implicated in its destruction. It can be argued that we are destroying the very communities that created the traditional environmental knowledge we now seek to preserve in our libraries and archives.

I believe that there are more compelling reasons to preserve TEK than the contribution of the knowledge gained thereby to the advance of Western cultural enterprises. First, TEK is a monument to our common humanity. Meticulous descriptions and comparative analyses have shown that all cultures produce scientific knowledge (Berlin 1992). In short, we are all scientists, at least part of the time. The evidence of TEK forces us to see ourselves and our science in a different light. No longer can we take refuge behind the myth of the superiority of Western civilization as the source of all science. (Nor must we take all the blame for it, either). Furthermore, the evidence of TEK exposes the flawed logic of those who argue that science can or should be value free (Feyerabend 1987). For TEK is inextricably embedded in systems of moral value and integrated with the global meanings we call "religion."

We may profitably consider "animism" in this regard. Animism is a religious principle upheld by many traditional subsistence-oriented communities of hunter-gatherers, fisher folk, and horticulturists (Brightman 1993; Feit 1973; Hunn 1990; Nelson 1982). As an explanatory theory, animism postulates that all living things (often including as well "nonanimate" natural elements such as wind, water, and stone) are animated by spirit, which entails a mode of consciousness, intelligence, will, and memory comparable to that attributed to human beings. As committed Darwinists, we consider such an explanatory principle to be quite simply false because it is anthropomorphic. On the contrary, we believe ["know"] that the natural world (perhaps excepting human action) is governed by impersonal, mechanistic forces and reflects an accidental design. However, if we are honest scientists we should be willing to admit that our belief in those impersonal, mechanistic forces is based on much faith combined with a lack of convincing contradictory evidence in our experience. The same test sustains animists' faith that the elements of their universe are conscious, moral entities. Such a belief has effectively guided them in their interactions with nature "since time immemorial." Why would they doubt it? In short, we should study TEK carefully in its social and cultural context to escape a perhaps fatal blind faith in our own particular brand of scientific truth (Feyerabend 1987:20).

There is yet another reason to preserve TEK: as designs for independent

alternatives to the globalization of a market mentality that at present comes close to overwhelming all competition for the hearts and minds of humanity. The socialist alternative—the so-called Second World, which complemented the First and Third Worlds of world systems theory—has all but collapsed. I suspect that the fate of the socialist alternative demonstrates that it was no real alternative to the industrial mode of production and the global market system that has forced the adoption of so-called economies of scale in our every productive endeavor. Communities that produce the TEK we seek to preserve are Fourth World communities, encapsulated within nation states, invariably small in population and poor by our standards of surplus wealth produced for market exchange. These communities are tied to very specific places that constitute their habitat and that are the target of their environmental knowledge. These “primitive” communities at the margins were abandoned by human history with the rise of states and of markets for labor and land (Marx 1964).

Yet some have persisted; some have resisted this historical trend. But their continued existence as partially autonomous and relatively self-sufficient communities within modern nations has not been tolerated graciously by proponents of progress. Rather, from the dominant development paradigm, such “backward” communities occupy valuable lands and constitute a pool of labor that could be integrated and employed “more productively” in furthering the reach of the world market.

Perhaps these ways of life, their religious visions, and their fragile, local systems of environmental knowledge are doomed. We may preserve a record of their ways of life, much as we might preserve some genetic traces of an obscure landrace of tepary bean, or corn, or potato in a vial of liquid nitrogen in a genetic resource bank for analysis by a future generation of scientists (Nabhan 1989), perhaps wiser and less rushed than our own.

I would like to argue that there is more at stake here than a historical record of past human accomplishments. I believe that our future as a species may hinge on preserving in print not just traces of traditional ecological adaptations, expressed as TEK, for the contemplation of future scholars. Rather, TEK systems embody the cultural diversity of the human species. As such their role in the evolutionary future of our species may be compared to the role of biodiversity in the future of life on earth. TEK bears more than a fanciful resemblance to the genome of a species (Boyd and Richerson 1985; Dawkins 1976; Pulliam and Dunford 1980; Ruyle 1973). That genome is a blueprint for a way of life that has survived. Each gene of the genome is a bit of information essential to the manifestation of the species in the life of each individual.

Likewise, TEK is a stock of ideas essential to the expression of a culture in the lives of its constituent individuals. The extinction of a species has been likened to burning a library. Might we make the same claim with regard to the extinction of a way of life and the loss of TEK that ensues? In each case extinction limits future evolutionary options. In the cultural case, we may be left with just one—the global capitalist consumer society.

I believe we should not only preserve a record of lost TEK in libraries and archives but also strive to preserve systems of TEK *in vivo*, *in situ* as radical alternatives to the present world system. To return to an earlier point: TEK is grounded in daily life, is sustained by its relevance to the exigencies of making a living off the land (Hunn 1982). That is why TEK is everywhere endangered today: Traditional communities rooted in ancestral lands have everywhere been dispossessed of those lands and in the process have been alienated from the work of harvesting the resources of their lands. Traditional knowledge of the land and of its resources is no longer relevant to the survival of the present generation as they pursue new livelihoods as migrant workers, factory employees, or panhandlers. The phrase “use it or lose it” well describes this situation. To preserve the full value of TEK, we must allow the members of traditional communities the opportunity to apply it in their daily lives, to maintain it, modify it, and pass it on to their descendants as still useful knowledge.

I am convinced that there is some measure of hope that the communities that gave us TEK can find space in which they may continue to exist, practicing their own ways of life as a distinct alternative to our own. The continued existence of such communities represents choices for our future. That some people, if given the chance, will choose such alternatives over participation in our vaunted modern world is proved by recent developments such as the “out-back” movement among Australian aborigines (Coombs et al. 1989), the persistence of reservation-based tribal communities in the United States in the face of confident predictions of their speedy demise, the demand by Native Alaskans and more recent immigrants to that vast state of a right to practice a subsistence way of life (Berger 1985), and a resurgence of interest in traditional farming and fishing practices in Third World nations such as Mexico (Toledo et al. 1985) and Palau (Johannes 1981:74-75).

Lest I be dismissed as a romantic, let me examine in more detail two cases in which “customary and traditional” subsistence rights have been vigorously and, by and large, successfully defended in the face of powerful political and economic opposition. Perhaps best known is the case of treaty guarantees of rights to fish, hunt, and gather shellfish, roots, and berries throughout tra-

ditional territories ceded by treaty in the Pacific Northwest (Cohen 1986). An exemplary statement of such guarantees on which contemporary treaty rights are based is the following provision of the "Treaty between the United States and the Yakama Nation of Indians" negotiated in 1855 by Isaac Ingalls Stevens, the first territorial governor and Indian agent for Washington Territory: "The exclusive right of taking fish in all the streams, where running through or bordering said reservation, is further secured to said confederated tribes and bands of Indians, as also the right of taking fish at all usual and accustomed places, in common with citizens of the Territory . . . ; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land" (Treaty of Medicine Creek, 10 Stat., 1132, Article III, paragraph 2).

This treaty language and its underlying intent have been interpreted many times by federal courts up to and including the U.S. Supreme Court (Cohen 1986:107-17). There is a broad legal consensus that the descendants of the indigenous "tribes," though they must accommodate their ways of life to the presence of the Euroamerican colonists (retaining only the right of harvest in common with [other] citizens), nevertheless are not required to abandon those traditions entirely. In fact, they are guaranteed the means, both legal and ecological, of continuing to support themselves by harvesting traditional resources at "all usual and accustomed places."

The famed Boldt decision (*United States v. Washington*, 384 F. Supp. 312 [1974]) of Justice George Boldt defined "in common" as implying a 50-50 division of available resources between tribal harvests and those of non-Indian sport and commercial interests. This decision further directed that the tribal right should not be rendered meaningless by virtue of destruction of the habitat necessary to sustain the resources in question (Cohen 1986:137-53). In what is known as Phase II of the Boldt decision, the question of how to protect the habitats essential to preserve the tribes' subsistence rights is addressed. In sum, our legal system opens a space for an alternative relationship to exist between a community of people and their local environment.

Cynics see the tribes as just another user group demanding their market share of a fast-dwindling resource. In my experience, there is reason to believe otherwise. Many tribal members oppose developing reservation resources for maximum profit, arguing that they should be preserved as a sacred trust or to preserve the solitude of the place or the purity of its water or the abundance of roots, berries, and game. Such "traditional" values may not be incorruptible, but they have withstood great pressure and survive to the present day.

My second example is the subsistence provisions of the Alaska National Interest Lands Conservation Act (ANILCA, Public Law 96-487; 1980). ANILCA added approximately forty-five million acres to the National Park System. In sharp contrast to the legal mandate for national parks in the lower forty-eight states, ANILCA provided for the continuation of subsistence uses. These were defined as: "the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, clothing, tools or transportation; for the making and selling of handicrafts out of nonedible by-products of fish and wildlife resources taken for personal or family consumption, and for customary trade." Specifically, the law directed the governmental agencies responsible for managing federal lands in Alaska to give priority over other consumptive uses to subsistence uses of natural resources, stating that "the continuation of the opportunity for subsistence uses by rural residents of Alaska, including both Natives and non-Natives . . . is essential to Native physical, economic, traditional, and cultural existence and to non-Native physical, economic, traditional, and social existence" (section 801).¹ (I'm unclear why it is essential for Native "cultural" existence but for non-Native "social" existence.)

National Parks in the lower forty-eight were established in many cases to preserve "wilderness," which effectively disallowed all "consumptive uses" of park resources, whether for commercial, sport, or subsistence purposes. Such park lands, instead, were "consumed" by hordes of tourists during brief vacations from the pressures of urban life. The notion that National Parks could accommodate ongoing subsistence harvesting—such as hunting, fishing, trapping, and wood cutting—by local "rural residents" was at first difficult for Alaska Park Service personnel to grasp. However, a "subsistence life style" is what attracted many early settlers to Alaska in the first place and is a political force to be reckoned with in Alaska today.

Subsistence is yet more sacrosanct in the dozens of Alaskan Native Indian, Aleut, and Eskimo communities that resist assimilation into the American mainstream. For many rural residents, their annual harvest of moose, caribou, or salmon and access to wood for house logs and fuel are an economic necessity. For others, the cost of purchasing, maintaining, and operating "subsistence tools" such as snow machines, outboard motors, and chainsaws may nearly balance the dollar value of their subsistence harvests, requiring that they work for wages to support their "subsistence habit." In either case, the opportunity to engage nature in this direct way gives meaning to their lives, strengthens their family and community ties, and stands ever in the way of

more capital-intensive land development schemes that might deprive them of their subsistence privileges.

The National Park Service has embarked upon a substantial research program since 1989 to document the realities of subsistence for communities within their jurisdiction. I was involved in one such study, which investigated the significance of the subsistence harvesting of plants for six rural communities located near Lake Clark National Park and Preserve, southwest of Anchorage (Johnson et al. 1997). These six communities differed in residential history, ethnic composition (Dena'ina Athabaskan Indian, Yup'ik Eskimo, and Euroamerican), religion (for example, Russian Orthodox, Evangelical Protestant), and degree of involvement in the cash economy (although extensive in all cases). Of particular significance to the degree of commitment to a subsistence way of life was the "rootedness" of the community in its local environment—which we measured in terms of the likelihood that household heads and their parents were born in the same community or region—and the complexity of the linkages between the subsistence practices of individual households and the social life of the community.

Several conclusions seem justified on the basis of this study: (1) subsistence should be understood as a long-term relationship between a community and its land and resource base, rather than as a strictly economic activity; (2) subsistence is dynamic, rooted in past practices but of necessity adapting to technological, demographic, economic, social, and political changes; (3) subsistence activities are integral to the life of families and communities, an aspect of their identity and continuity expressed in subsistence work; and (4) the meaning of subsistence is different for each community, varying with the ethnic, religious, and economic histories of communities and their component families. Finally, effective management of subsistence activities on federal lands demands that a truly cooperative spirit pervade all aspects of management, including monitoring, policy formation, and enforcement.

As in Alaska, Puget Sound Indian fishermen exercise their treaty right to fish at "all usual and accustomed grounds and stations" by means of rather untraditional technology. They no longer use hand-hewn cedar dugouts, fishing lines and nets of twined nettle bark bast, or harpoon blades of mussel shell fused to fir spear shafts with spruce pitch. Instead, they set nylon nets from fiberglass skiffs powered by eighty-horse Merc outboards. Some observers of this scene find it hypocritical of the Indians to assert a customary right to harvest traditional resources using such modern, "white man's" methods. To my way of thinking, there is no necessary contradiction. Technologies have always

evolved to meet new demands and to take advantage of new means. What is critical is not the means but the motives.

Are these treaty fishermen engaged in an industrial and commercial enterprise the goal of which is to maximize profits and to compete for an ever-greater market share? Or are they engaged in making a living by harvesting the resources of their ancestral homeland in hopes that their children and grandchildren may do the same? The issue of production for direct consumption—that is, do they eat all and only the food they harvest?—versus production for exchange—do they sell some of what they harvest for money to buy necessities that they do not or cannot produce locally?—clouds the issue somewhat. However, the notion of an entirely self-sufficient "primitive" community does not match ethnographic or historical reality. Some production for exchange is reported for most if not all subsistence-based communities. At what point production passes that invisible line differentiating subsistence from commercial production is an issue I leave for future argument. Still, the analytical distinction between subsistence and market orientations is critical to my argument here. TEK is a consequence of subsistence-based production. We cannot preserve the one without preserving the other.

Karl Marx, by Way of Conclusion

I have argued that to preserve TEK we need to encourage the continuity of subsistence-based communities where such knowledge is produced. This proposal may seem to be against history, which has conspired everywhere to destroy such communities. Such is Marx's vision of human history: Subsistence-based communities are survivals of Marx's "Archaic Formation," which everywhere preceded the development of societies structured by class divisions. Marx concluded, "The precondition for the continued existence of the [primitive] community is the maintenance of equality among its free, self-sustaining peasants, and their individual labour as the condition of the continued existence of their property" (1964:73). The growth of population and the reliance upon war by one community against another to gain land to support that population led to the emergence of states (Marx 1964:71; Leacock 1972:46–57). The emergence of a trader class in the "interstices" of these early states sowed the seeds of capitalism, which like a great weed overwhelmed the feudal garden.

Marx's utopian vision of a communist end point to history was predicated on his expectation "that communism would be a re-creation, on a higher level [of productivity], of the social virtues of primitive communalism . . ."

(Hobsbawm 1964:51). Marx at first welcomed "capitalism as an inhuman but progressive force," but in his maturity "found himself increasingly appalled by this inhumanity" (Hobsbawm 1964:50). He thus came to stress "the viability of the primitive commune, its powers of resistance to historical disintegration . . ." (p. 50).

The inhumanity Marx despised in capitalism was not, however, informed by a clear sense of capitalism's ecological impact, for no science of ecology existed in his day. He recognized that human production was ultimately dependent on nature: "The earth is the great laboratory, the arsenal which provides both the means and the material of labour, and also the location, the *basis* of the community . . . which produces and reproduces itself by living labour" (Marx 1964:69). However, his hope for a communist utopia presumed an infinite productive capacity. I share Marx's horror at the destructive power of global capitalism, its insatiable hunger for resources with which to turn a profit, "its incredible potential for both enormous creation and for insane—perhaps ultimate—destruction: the heritage of the 20th century" (Leacock 1972:57). But I see it as a threat not only to human values but also to the earth itself.

What were the moral strengths of the "primitive commune" that Marx saw being subverted by history? Essentially, he valued the organic unity of a community of human beings tied to their land by their own labor with which they produced their livelihood and in so doing reproduced their community. *TEX* constituted the intellectual capital for such communities and was in turn a product of the unity of land and labor that sustained it.

What has led to the disintegration of these primitive communities across the globe during the past five thousand years? Marx saw this as a complex question, for the archaic base assumed various forms, which he labeled the "Asiatic," "Slavonian," Germanic," and "ancient [Greek]" (Hobsbawm 1964:35), each with its peculiar evolutionary potential.

In keeping with his dialectical method, Marx sought the roots of this disintegration in the internal contradictions of the primitive communal social formation. What were the contradictions that contained the seeds of its destruction? Marx answered, "War . . . is the great all-embracing task, the great communal labor [of the primitive community], and it is required either for the occupation of the objective conditions for living existence [i.e., land] or for the protection and perpetuation of such occupation" (1964:71). Thus, each community must be prepared to wage war to protect that share of the earth—"the arsenal which provides both the means and the material of labour"—that

sustains it. The consequence of war, however, is enslavement or enserfment of the conquered by the conquerors. Thus class divisions arise that split apart the community, the dominant class expropriating the labor of the subordinate class for its own purposes. War in turn was seen as a consequence of "the advance of population" (p. 83); "the mere increase in population constitutes an obstacle. If this is to be overcome, colonisation will develop and this necessitates wars of conquest. This leads to slavery. . . . Thus the preservation of the ancient community implies the destruction of the conditions upon which it rests" (pp. 92–93).

Yet the states and empires of antiquity remained, according to Marx, "system[s] of production for use," and thus, in such systems, "no boundless search for surplus labour arises from the nature of production itself" (quoted in Hobsbawm 1964:30). But the "ancient conception, in which man always appears . . . as the aim of production [is inverted by] the modern world, in which production is the aim of man and wealth is the aim of production" (Marx 1964:84). Capitalism represents a radical departure from this "ancient conception." It emerges almost imperceptibly at first, taking root in the "interstices" of the ancient and feudal states: "Wealth as an end in itself appears only among a few trading peoples . . . who live in the *pores* [emphasis added] of the ancient world"; "The main agent of disintegration [of feudalism] was the growth of trade" (p. 64); "Crucial to the development of capitalism is therefore that of the world market" (Hobsbawm 1964:30).

Marx's analysis of human history is wrong on many details, and Marx is dead wrong, in my view, in his belief that capitalism is the penultimate stage in that history, to be followed by a utopian recreation of a global village sustained by the presumed infinite productive capacity of humanity once liberated from class exploitation. Nevertheless, I am convinced by his argument that the root of our present predicament (as well as the source of our present precarious prosperity) lies in the mass alienation of human beings from the work of subsistence on their own land. My vision of the future is far more modest than Marx's. I believe that the present global market system, like that of the monolithic edifice of feudalism before it, is cracked and creviced. The "interstices" of the system may shelter alternative modes of production. The stubborn persistence of contemporary subsistence-based communities—like weeds that push up through cracks in the pavement—sustains that belief. Such communities survive by taking advantage of residual legal claims to control land that they then work with their own labor and resources, nurturing and protecting it for their children and grandchildren. They hold the world mar-

ket and the national governments that serve it at bay. We should lend them our support, as their survival serves us all by preserving in the practice of their daily lives living examples that alternatives exist to the present world order.

Note

1. This section draws from a work plan entitled "A Critical Review of the Literature Associated with the Cooperative Management of Parks and Equivalent Preserves and Selected Case Studies Pertinent to the Management of Alaska Units of the National Park System," submitted to the U.S. National Park Service, Alaska Regional Office, by E. Hunn, D. Johnson, C. Sander, and C. Sawin-Wilson on behalf of the Cooperative Park Studies Unit, College of Forest Resources, University of Washington, Seattle, 1993.

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The World in 2065: A rapidly changing climate and a renewed social science by Gioia Barnbrook. Communities in the Arctic, and the researchers who work alongside them, are already noticing drastic changes in their environment: rising temperatures are affecting sea ice and making traditional subsistence hunting activities far more precarious and dangerous; people have died travelling by snowmobile across previously solid ice that rising temperatures have made fragile. From this vantage point, the future looks decidedly bleak, and we may well wonder. Those social sciences that emphasise long-term qualitative research, such as my own discipline of anthropology, will be of particular value in developing regional and group-specific responses. Subsistence agriculture occurs when farmers grow food crops to feed themselves and their families. In subsistence agriculture, farm output is targeted to survival and is mostly for local requirements with little or no surplus trade. Subsistence agriculture was the dominant mode of production in the world until recently, when market-based capitalism became widespread.[3] Subsistence horticulture may have developed independently in South East Asia and Papua New Guinea. However, such farmers often recognize the value of such compost and apply it regularly to their smaller fields. They also may irrigate part of such fields if they are near a source of water. In some areas of tropical Africa, at least, such smaller fields may be ones in which crops are grown on raised beds. The future of manufacturing. Read our latest thinking on the future of manufacturing. Manufacturing's role is changing. Globally, manufacturing continues to grow. It now accounts for approximately 16 percent of global GDP and 14 percent of employment. For policy makers, supporting manufacturing industries and competing globally means that policy must be grounded in a comprehensive understanding of the diverse industry segments in a national or regional economy, as well as the wider trends affecting them. For example, shapers of energy policy need to consider which segments will be affected by higher or lower energy costs, how great the impact is likely to be, and what magnitude of difference will trigger a location decision.