

Embracing the sacred: an indigenous framework for tomorrow's sustainability science

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Abstract Mahalo (thank you) for reading our paper. What you will find is an attempt to synthesize and compare the strengths and weaknesses of Indigenous and Western perspectives on sustainability and a proposed path leading to the integration of these two perspectives into a sustainability framework that considers resources as much more than commodities. We enter into this discussion with 50 years of experience between us, both of us products of our experimentation with the integration that we are advocating. From this experimentation, we have concluded that sacred relationship must be the foundation of any successful sustainability effort, with success achieved only when resource management practices and policies engage the spirit and are aligned with equitable and respectful interactions among human and non-human. By sacred, we refer to those sentiments, actions, and commitments that emerge from spirit-based relationships that are founded on love, respect, care, intimate familiarity, and reciprocal exchange. By spirit, we refer to that which gives life to the material body, the enigma that is our collective conscious, subconscious, and unconscious beings. In formulating this paper, we made three assumptions: (1) the need to shift our spiritual selves, and our collective weight and resulting ecological footprints, is fully evidenced by the failure of purely Western approaches to sustain the social and biophysical world around us; (2)

each and every citizen of our planet contributes to both sustainability's advancement and its demise; and (3) by engaging the spirit and reclaiming sacredness in all our relationships, we can help move the Earth community towards her fullest potential of wellbeing. Our hope here is that we are able to grow the connections among a nascent but rapidly evolving transformational vision for sustainability, the enlightened thinking of contemporaries, and inspired ancestral knowledge. To facilitate the continued emergence of this transformative vision, we marry Western sustainability concepts to an Indigenous sacredness framework.

Keywords Hawaii · Aloha aina · Malama aina · Love · Relationship

A Greeting

ALO-HA to YOU reading!

The response, if you choose, is ALO (uh-lo) HA (ha)

Alo-ha to the place in which you are reading this article

Alo-ha to your oikos, your home

Alo-ha to your family

Alo-ha to the people around you

Alo-ha to your mountain, your flat land, your water source, your ocean, your forest, your grasslands

Alo-ha to dry-ness, your heat, your season flooding, your coolness

Alo-ha to your bird people, your people on twos, on fours, on eights

Handled by Renee Pualani Louis, The University of Kansas, USA.

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Orienting ourselves

We are here in Hilo, Hawai'i. I (Kekuhi) would like to introduce you to our community. We are almost there.

I have arrived (I should probably say we have arrived since your here too, right now). I park the car, sit on the nearest rock, open my lap top, and begin chanting softly to ask for permission to be in the place to record this moment for the purpose of this article. At this very moment, I coerce my fingers to strike the keyboard as I turn my sensual and inward attention to this place called Puhī, a very little bay in my hometown of Hilo on Hawai‘i Island. Mauna Kea and Mauna Loa mountains (intimately referred to by my children as Papa Kea and Mama Loa) are in the background as Kanehoalani or grandfather sun begins his descent between the mountains. Alo-ha old ones.

Alo-ha e Puhī, I whisper. The exhale of the blow hole answers, alo-ha. (A very useful courtesy my grandmother taught me.)

There in front of me the current pulls out revealing the scent of seaweed. Spring water trickles into the ocean. As I inhale, the surface of the ocean moves up; as I exhale, the surface of the ocean recedes, in and out, up and down. To the south I see Kauku, a small cinder cone created by two deities fighting one another. Hello Kauku. OH!!! Just saw a turtle come up for air. There he is again! And again! Alo-ha ancient one. The moa‘e, prevailing wind or breeze from the ocean, is our constant. Welcome back, I say. Because for the last two weeks, the surface lava flow has sucked the moisture out of the air and frightened away the rain, while making plans with the sun (volcano’s father) to dry up everyone’s grass. Silly Tutu Pele (grandmother lava)!

Alo-ha coconut trees and moving fronds,
Alo-ha ulili bird,
Alo-ha again, turtle,
Alo-ha guy on your paddle board. OH! Who just fell off,
Alo-ha cliffy coast line,
Alo-ha family swimming across the way,
Alo-ha, sea spray.

The moa‘e breathes, I breathe too. Ocean breathes, I breathe along.

I invite you to learn this process. Big breath in and say ‘ALO’—completely release the breath and say ‘HA’! Two more times, please. Together we just thanked the moment at Puhī. I cast the eyes downward as a gesture of respect to my community. And then wait for a response. Then, I pick up the rubbish around me and ask for permission to leave. Till the next time, Puhī. I ola ‘oe, I ola ia‘u nei. I live in you, you live in me. This process is Alo-ha, an in-the-moment relationship and reciprocal exchange (Alo) of breath (Ha).

Introduction

“The land has become an extension of Indian thought and being because, in the words of a Pueblo elder ‘It is this place that holds our memories and the bones of our people...This is the place that made us’.” Greg Cajete 1999

“A man is ethical only when life as such is sacred to him, that of plants and animals as well as that of his fellow men.” Albert Schweitzer, 1933

The advent and eventual primacy of the academic research enterprise, social and cultural modernization, and the market economy are Western sustainability science’s double-edged swords. These engines of change have contributed a great deal to improvements in the quality of life for humans across the planet: medical research and resulting innovations have extended lives and reduced or in some cases eliminated crippling diseases; slavery once normative is now a distant and shameful memory for much of humanity; and access to goods and services is being elevated for much of the Earth’s citizenry. And yet there are negative consequences including ecological degradation on unprecedented scales (Dirzo et al. 2014; The Millennial Ecosystem Assessment, www.millenniumassessment.org/), large-scale disenfranchisement from market-based promises of prosperity (Hawken 2011), and emotional and psychological isolation in an era of electronic hyper-connectedness (Louv 2006). Additional important but rarely discussed changes accompanying humanity’s march to modernity, and the focus of this paper, are the relentless infilling of a commodity ethic into our daily life, including into relationships with family and environment, and the diminishing role of the sacred in these foundational relationships (Louv 2006; Vaughan-Lee 2013 and chapters within; Nash 2014). We view these changes as important because expanding commercialization coupled with declines in how and where the sacred is expressed have transformational impacts on the sustainability of human health and wellbeing—admittedly complex terms that are viewed differently by Western and indigenous communities.

Western sustainability science most often considers human individual and community wellbeing as a function of the supply of resources and services that underpin health, where wellbeing is gauged as an individual having physical and emotional health, access to social and personal resources, and retaining physical capabilities (The Millennium assessment). Indigenous perspectives further consider attributes that directly connect the individual to community and to the surrounding ecological world,

because these persistent and intimate relationships provide sustenance (Vaughan and Vitousek 2013). These locally based sustenance relationships contrast Western sustainability's anonymous and ephemeral market-based consumer relationships mediated by the black box of international commerce. Simply stated, Western sustainability has concerned itself primarily with events and activities that operate on either side of that black box, with intentional lack of attention on the nature of the linkages across the black box, while Indigenous sustainability is fundamentally dependent on and so concerned with these linkages (Berkes 1999; Cajete 1999; Berkes et al. 2000; McGregor et al. 2003). As noted by Donatuto et al. (2014), Indigenous concepts of wellbeing include not only "familial and community-wide considerations" but also reflect "interlinked social, cultural, spiritual, environmental and psychological aspects of health" that are "structured in content and internal logic, and comprise practices and knowledge about connections between human beings, nature, and spiritual beings". Critically, it is this embracing of resources from within a network of sacred relationships that distinguishes Indigenous from Western approaches to sustainability (Berkes 1999; Vaughan and Vitousek 2013). This concept is eloquently captured by Cajete (1999), who describes a theology of place that is founded on the notion that one's sense of place is "constantly evolving and transforming through the lives and relationships of all participants" because, he continues "Humans naturally have a geographic sensibility and geographic imagination borne of millions of years of interactions with places. Humans have always oriented themselves by establishing direct and personal relationships to places in the landscapes with which they have interacted."

Considerations of the sacred often underpin discussions of wellbeing, and these considerations have varied over time and across both Indigenous and Western cultures (Leopold 1949; Trenholm 1986; Berkes 1999; Cajete 1999; Berkes et al. 2000; Vaughan-Lee. 2013 and chapters within; Nash 2014). Within Indigenous communities, beliefs about the sacred are tightly coupled to place-based knowledge systems and culturally driven management practices. These systems operate as shared responsibilities that bind communities (Vaughan and Vitousek 2013), and are transferred across generations through regular community practice (Berkes 1999; Cajete 1999). Throughout human history, Indigenous sacredness as a natural resource ethic has conflicted with western commodity-based approaches to resource management and conservation (Trenholm 1986; Williams 1990; Nash 2014). Today, these conflicts span from the scale of an individual's daily decision making about cost versus environmental stewardship and respect for life to that of wars that arise between local communities and market-driven entities

seeking to secure the raw materials and labor required to produce wealth.

Clearly, many Western-based resource management and conservation efforts were the result of sacred relationships between person and place (Nash 2014). Further, a sacredness ethic (Leopold 1949) has given rise to many of Western sustainability's modern examples of thoughtfully implemented stewardship, from fishing and forestry to mining and energy production (Hawken 2011). However, within the ecosystem services framework, Western sustainability science's dominant paradigm (The Millennium Assessment), sacredness has been relegated to a minor service in an effort to fully commodify sustenance relationships between society and the natural world. Because of strong pressures to minimize costs while maximizing services and profits, the ecosystem services paradigm ultimately may limit the capacity of Western sustainability science to catalyze and achieve large-scale sustainability.

Delving deeper, indigenous subsistence relationships are informed by inter-generational accumulation of intimate knowledge of local resources, with the ever-present need to survive as the driver of local innovation and adaptation to environmental change (Cajete 1999; Berkes et al. 2000). And so sustainability in an indigenous framework can be seen as the capacity of a community to access and manage local natural resources, or to construct a resource supply via agriculture or husbandry, so as to assure the survival of and interconnectedness of the members of both that community and the environment, what Cajete (1999) describes as respectful relationship. In contrast, commodity-based resource management requires time investments into Western systems of learning, financial investments into the infrastructure of resource acquisition and transport, and political investments that enhance economic competitiveness and increase access to resources. Within this market-driven framework, sustainability is the desired condition wherein access to a resource is stable, secure, and as inexpensive as possible; high security, long-term stability, and low cost are achieved by a wide variety of means, both ethical and unethical, in order to assure the continued supply of goods and services to a global network of consumers. It is not surprising then that knowledge about commodity-based resource management is generated by paid professionals where activities are aligned with corporate interests.

Within a sacredness ethic, taking of resources is viewed as an exchange and a privilege that comes with stewardship responsibilities, and the knowledge that to waste has direct consequences on the web of interactions that sustain life (Berkes 1999; Cajete 1999; Johnson and Larsen 2013). In contrast, a commodity ethic, even when tempered by thoughtful resource management, legislated environmental regulations, or consumer activism, is founded on

maximizing consumer purchasing power and profits for shareholders. Within a commodity-driven framework, resource extraction and associated consequences are difficult for the consumer or shareholder to consider because distances between resource and consumers/shareholders are typically large and convoluted such that acts of degradation are often hidden. Further, the global-scale commodification of resources and services means few still retain the knowledge of how to steward their own goods and services, have relationships with the landscapes that sustain, or experience how consumption impacts environment and humanity.

We suggest that as with the loss of our connection to the landscapes that sustain us, familial perspectives on sacredness are increasingly impacted by the encroachment of the commodity ethic into daily life. Many of us still retain elements of the sacred in our interactions with family and community. For example, while intrepid economists have quantified the financial benefits of marriage, and official union does come with tax benefits, marriage still represents the sacred union between two loving individuals. And most parents view the birth of a healthy child as a sacred gift, much more than a tax break, with child rearing still defined by sacred devotion to a child. The developed world's concept of care for elderly parents provides a poignant counter example, however, where care is no longer a sacred exchange between parent and child, but rather a market-driven commodity. As with parental care, commodity-driven distractions are whittling away our capacity to love and sustain sacredness within our marriages and between parents and children. Many of us have witnessed couples having lunch with their cell phones, or have relied on electronic babysitting. The cumulative effect of these distractions is to make us less than human, cynical, depressed, addicted, and undeniably unsustainable (Louv 2006). When we reclaim and embrace the sacred in everyone and all around us, when we act in ways that maintain spirit-focused relationships with family, with community as an extension of our family, and with environment as an extension of our community, we grow our capacity to love and attain a soulful state—joyful, fulfilled, connected, and undeniably sustainable.

Foundations of Western sustainability science

Sustainability has been described in Western literature in various ways. From Merriam Webster: “Sustainability: of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged.” From Wikipedia: “The word sustainability is derived from the Latin *sustinere* (tenere, to hold; sus, up). More broadly sustainability is the capacity to endure. In

ecology the word describes how biological systems remain diverse and productive over time. Long-lived and healthy wetlands and forests are examples of sustainable biological systems. For humans, sustainability is the potential for long-term maintenance of wellbeing, which has environmental, economic, and social dimensions. Healthy ecosystems and environments provide vital goods and services to humans and other organisms. There are two major ways of reducing negative human impact and enhancing ecosystem services and the first of these is environmental management. This approach is based largely on information gained from earth science, environmental science and conservation biology. The second approach is management of human consumption of resources, which is based largely on information gained from economics.”

A more modern and comprehensive perspective on sustainability is captured in the Millennium Ecosystem Assessment: “The MA is an assessment that focuses on the linkages between ecosystems and human wellbeing and, in particular, on ecosystem services. An ecosystem is a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit. The MA deals with the full range of ecosystems—from those relatively undisturbed, such as natural forests, to landscapes with mixed patterns of human use, to ecosystems intensively managed and modified by humans, such as agricultural land and urban areas. Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fiber; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling. The human species, while buffered against environmental changes by culture and technology, is fundamentally dependent on the flow of ecosystem services.”

The conceptual framework for the MA posits that “people are integral parts of ecosystems and that a dynamic interaction exists between them and other parts of ecosystems, with the changing human condition driving, both directly and indirectly, changes in ecosystems and thereby causing changes in human wellbeing. At the same time, social, economic, and cultural factors unrelated to ecosystems alter the human condition, and many natural forces influence ecosystems. Although the MA emphasizes the linkages between ecosystems and human wellbeing, it recognizes that the actions people take that influence ecosystems result not just from concern about human wellbeing but also from considerations of the intrinsic value of species and ecosystems. Intrinsic value is the value of something in and for itself, irrespective of its utility for someone else.”

The main findings of the MA include (1) “Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.” (2) “The changes that have been made to ecosystems have contributed to substantial net gains in human wellbeing and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.” (3) “The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the millennium development goals.” And 4) “The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios that the MA has considered, but these involve significant changes in policies, institutions, and practices that are not currently under way. Many options exist to conserve or enhance ecosystem services in ways that reduce negative trade-offs or that provide positive synergies with other ecosystem services.”

The above assessment of planet Earth’s ecosystem services suggests that global management of natural resource is in a dire state. We argue that Western sustainability science has strengths that equip it for improving natural resources management, but it also has weaknesses that may contribute to continued degradation. Strengths include methodologies and associated metrics that allow the impact (negative and positive) of actions (or inaction) to be quantified and monitored over time. For example, if society defines clean rivers as a sustainability value, Western sustainability science can provide specific metrics for what constitutes clean water and the tools for quantifying and monitoring cleanliness of the water over time, and the methods for correcting deviations. More generally, the assigning of value to an organism, process, or outcome allows sustainability science to then develop, test, apply, and validate metrics for the sustainability of that organism, process, or outcome, as well as methods to correct departures from a desired condition. Further, because of the hypothesis-driven framework in which Western sustainability science operates, managers can rely on robust results derived from complex analyses, often published in peer-reviewed publications (e.g., Root et al. 2003; Lamb et al. 2005; Hessburg et al. 2012; Dirzo et al. 2014; Vignieri 2014). Given a reliance on strong metrics, managers know what component of an ecosystem is being examined and so to some extent what is being ignored. An additional

strength is the systems nature of Western science. That is, Western sustainability science has biophysical tools (hydrological and biogeochemical techniques, economic analyses, remote sensing, modeling, etc.) to examine the effects of change on an entire system and how change varies across systems, for example, climate effects on water delivery from entire mountain ranges, management effects on global warming potential of entire regions, or policy effects on fossil fuel consumption of entire countries. Western sustainability science provides this knowledge via case studies, experiments, and synthetic analyses, elaborating the meaning and mechanics of Western sustainability at multiple scales (Fig. 1).

Western sustainability science also has important weaknesses. At the conceptual level, Western sustainability science remains a surprisingly poorly defined identity as exemplified by ongoing debates about the motivations and drivers of resources management (e.g., Chase 1986; Marris 2011; Tallis et al. 2014). Similarly, there is a poor understanding of the target baseline for sustainable management of resources and landscapes, itself complicated by realities of ever-changing natural forces that affect systems (Livingston 1968), and of human-induced global change (Root et al. 2003; Hawken 2011; Dirzo et al. 2014). Further complicating the concept of target baselines are regularly used anthropomorphizing descriptors such as healthy (versus unhealthy) in the management of ecosystem composition, structure, and function (Chase 1986; Hobbs et al. 2014). This concern is not restricted to present day, human-related disturbances; the ecological sciences have shown robustly that most of the Earth’s ecosystems have been subject to millennia of human activities (Crutzen 2006). And so baselines tend to be arbitrary—a compromise function that integrates societal pressures, ownership needs, and scientific best guesses at, for example, what something might have looked like had Europeans not settled in an area. A few enlightened best guesses attempt to consider the long-term presence of native cultures and the effects of their management on land, all the while keeping in mind that global change has always and continues at an accelerated rate to alter ecosystem composition, structure, and function.

In the application of Western sustainability science, other weaknesses closer to the ground have emerged. Because of various pressures on management to succeed, managing for sustainability has at times drifted to “command and control” solutions (Chase 1986; Holling and Meffe 1996). Complicating what already are often intractable ecological problems, applications of Western sustainability science can encounter conflicting public sentiments about management, distrust of agency leadership especially when controversial management decisions seek to be implemented, and short-sighted political

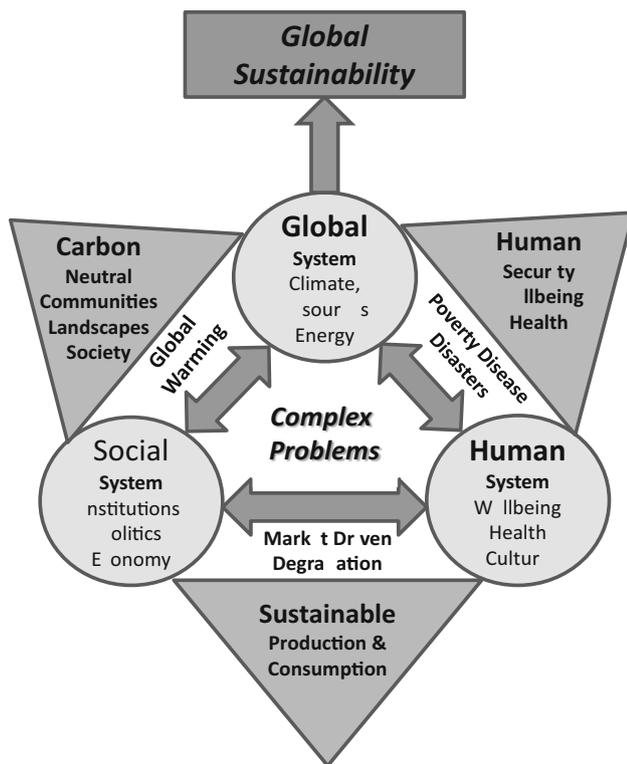


Fig. 1 Western, global-scale sustainability is a function of three systems operating at the individual, societal, and global scales, as well as their linkages and solutions to complex problems (adapted from Komiyama and Takeuchi 2006)

pressures to achieve outcomes that may not lead to real solutions (Chase 1986; Komiyama and Takeuchi 2006). Further, because Western sustainability science must provide simple metrics that can be easily and quickly adopted by resource management entities that seek cost-effective approaches that work across systems, the focus of management applications is on a small number of charismatic or economically important organisms, processes, or outcomes that are of broad interest and perceived value. Sustainability of an entire system, including all of its components, typically cannot be examined or managed because resources, tools, and even understanding are lacking (Chase 1986).

Despite these weaknesses, humanity has turned to Western sustainability science for help with achieving the incredible balancing act of meeting: (1) society's need for equitable access to life sustaining resources (Ostrom 2009; Lamb et al. 2005; Vignieri 2014; The Millennium Assessment); (2) the profit expanding needs of corporations and share-holder beneficiaries who are often disconnected from, and even misled about corporate resource extraction activities (Hawken 2011); and (3) academic research's need for reliable and robustly measured sustainability metrics. To achieve this balancing act, Western

sustainability science may need inwardly directed and reflective critiques. We suggest one important question is whether the commodity ethic, on which Western sustainability science and the ecosystem services paradigm currently rest, can continue to be relied upon to solve our most pressing sustainability issues. On this question, Winthrop's (2014) critique of the ecosystem services paradigm is illustrative, making the case that the ecosystem services approach cannot be credibly used to understand let alone value Indigenous cultural services because the paradigm and its methods are incompatible with the social construction of Indigenous environmental experience, the symbolic character of Indigenous environmental knowledge, and the multidimensionality of Indigenous environmental value. This timely critique may be broadly relevant if, as we contend, Indigenous perspectives on the sacred offer an important alternative to the market-driven commodity ethic.

Foundations of an indigenous sustainability science

Indigenous sustainability science emphasizes place, relationship, and sacred exchanges among humans and the resources required for survival (Johnson and Larsen 2013). The concept and practice of sacredness in the context of sustainability is a relatively new academic field of study (Berkes 1999), but has been strongly developed and expressed within traditional Indigenous communities for millennia, most often accurately captured in Indigenous-authored academic writings. Indigenous sustainability science emphasizes humans as components of a complex system that make up with other organisms an ecological web (Vaughan-Lee 2013 and chapters within; Donatuto et al. 2014). In this framework, ensuring the long-term health of the system directly supporting one's survival and survival of community members is the goal. And so quality of life is adjusted to meet the needs of the system and future generations. To achieve this, Indigenous sustainability science seeks local knowledge particularly relevant to a place, often scaled down and attained through long-term and local relationships that lead to the accumulation of observations and experience. This contrasts Western sustainability science, which seeks general knowledge applicable across systems, with data being aggregated upwards and gained through broadly established methods and protocols. And so while Western-based studies need not include as experts people from the place being studied (approaches are agnostic, so to speak), Indigenous science cannot proceed without individuals who are from the location being studied because expertise and knowledge resides with local individuals. A closely related contrast involves ways of knowing. Indigenous sustainability

science emphasizes familial, that is regular and intimate approaches to knowing as with friends, spouses, children, parents, and extended family members. In contrast, Western sustainability science emphasizes objective data-driven process, typically long-term monitoring of indicator variables or short-term experimental data collection.

To elaborate on these concepts, in this next section, we draw strongly on Native Hawaiian perspectives because it is the land base and the system most familiar to us. There are many elements to a native Hawaiian ethic of sustainability, but we focus on two of the most understood and practiced: Aloha aina and Malama aina, translated, respectively, as to love the land and to care for the land. Aloha is an in-the-moment relationship and reciprocal exchange (Alo) of breath (Ha) resulting from a relationship or bond between entities that is characterized by mutual benefit, commitment, and physical exchange. To give aloha for another entity involves a commitment that assures the wellbeing of that entity, and more important for this discussion, that allows the giver to see one's self in each and every entity. Malama is the result of aloha-based relationships because the act of loving an entity must translate into caring for that entity, with care including protecting, tending, stewarding, and where needed restoring health and wellbeing. And so in the practice and engagement of Aloha aina and Malama aina, we achieve a deep love for and commitment to caring for and protecting our surroundings, made real through relationship with the land, broadly defined as the world with which a native Hawaiian engages.

A third fundamental element of this Hawaiian Indigenous ethic of sustainability is the idea of resource as akua or deity. An extension of this ethos is that all forms and functions (biotic and abiotic, physical and non-physical, observable and non-observable, dynamic, inert, internal, external) are akua expressions. As a result, all interactions are by definition akua or potentiality, and so are sacred. But what does that mean, to be sacred? In native Hawaiian thought, sacred means that there is vitality about an object, a thought, a feeling, or an action, which is experienced through relationship. It is this vitality or mana that brings form to some things and consciousness to others. In certain relationships at certain times there is no form, just mana. This is spirit, the sacred, divinity—a-kua. This perspective recognizes that it is the potentiality of each and every life and non-life form, and its akua state that sustains life, human and non-human, whether it is fresh water for habitat or drinking, soils for growing forests or crops, or air that is breathed. And so the world is an ever-present and continuous expression of divinity—your divinity, a tree's spirit, the sacredness of the lava, the ocean, sky, the rock, a baby, an idea, and so on. The invitation of Hawai'i sustainability is that kanaka (humans) are an intimate part of this

continuous expression. By extension then, to ignore, permit, or actively participate in the degradation of kanaka or the aina (environment) is to ignore, permit, or actively participate in the degradation of a family member. Ultimately, this degradation returns to the self.

From an Indigenous Hawaiian point of view, environmental kinship and the ancestral teaching of I ola 'oe, i ola ia'u nei (You live in me, and I live in you) is an everyday reality, and implicit in Hawaiian Indigenous perspectives on Sustainability. The Hawaiian perspective on life cycle is not based in the linearity of living, but a literal "cycle" of living, reproduction, and dying. Even in death we are contributors to living. Our physical bones return to Papa, to feed the earth, and the mana of our wailua or spirit is recycled into one of many other natural phenomenon, be it animal, plant, elemental, air, or water. In this way, there is no absolute beginning or finality of ending; there is only the beginning and ending of cycles. We are creators and co-creators of some these cycles, and there is no forgetting exactly who we are biologically, physically, psychologically, and genealogically because we are alertly aware of the dynamic continuity of our relationships and these cycles. And therefore, Native Hawaiians recognize that relationships between the animate and inanimate, visible and invisible, human and nature, and between the conscious, subconscious, and unconscious are inherently indivisible.

The term 'ohana, or family, applies to this environmental relationship, and is above all the single most important element relating to Hawaiian Indigenous sustainability, the ability to identify the water source to whom one is related, to embrace as family the natural phenomenon that are part of the organic lived world. And so, in a socio-cultural context, a Hawaiian perspective of 'ohana will include, for example, biological and/or adoptive parents, all relatives dead or alive, the 'i'iwi bird, the taro plant, lightning, a particular shark guardian, or a particular rock formation. Puku'i and Handy (1998) so expertly and succinctly state in *The Polynesian Family System in Ka'u, Hawai'i*:

"A Hawaiian's oneness with the living aspect of native phenomena, that is, with spirits and gods and other persons as souls, is not correctly described by the word rapport, and certainly not by such words as sympathy, empathy, abnormal, supernormal or neurotic; mystical or magical. It is not 'extra-sensory,' for it is partly of-the-senses and not-of-the-senses. It is just a part of natural consciousness for the normal Hawaiian—a 'second sense,' if you will...but it is not 'sight' only, or particularly, but covers every phase of sensory and mental consciousness....To comprehend the psyche of our old Hawaiians it is necessary to enlarge the implications of the word 'relationship'

beyond the limitations of the ‘interpersonal’ or social. The subjective relationships that dominate the Polynesian psyche are with all nature, in its totality, and all its parts...” (pp. 117–118)

The landscape is an essential part of this totality, and not only that which is under one’s foot. Aina or landscape is the physical geography of the island, the surrounding ocean, the different levels in the firmament of the heavens and all bodies of the heavens, layers of earth, all creatures, vegetation, mineral, and elemental phenomenon. Landscape also implies the metaphysical, non-material elements such as the dreamscape, ancestral memory and ancestral prompting or what is commonly known as na‘au or gut feeling, vitality or mana, and a host of other “unobservable” dynamics. The later type of landscape is what, inevitably, maintains the connection of the individual to her familial relations in nature. That all these features are included in the notion of landscape may seem peculiar, but without the non-material landscape, the primary connections among members of the larger ‘ohana are severed.

The social-ecological reality of belonging to and being connected with the surrounding environment is simply depicted in familial terms such as ‘ohana, meaning taro stalk; kua’āina, meaning back bone of the land; and, kama’āina, child of the land, or one who is physically, psychologically, biologically, and genealogically inseparable from the surrounding environment. We will refer again to the clarifying insight of Handy and Puku’i in their explanation of Hawai’i perspective as “the old Hawaiian theory of Natural History” (p. 122), and kinship, based on the “systematic theory” (p. 122) and analogical logic of kinolau (p. 122–126):

“The comprehension of the relationship of persons and families in these islands to natural phenomena and the various genera of plants and animals, requires an understanding of the old Hawaiian theory of Natural History. This theory was based upon the observation of the resemblances, in form, in colour, in some notable detail of marking, or of habit, between natural phenomena, plant and animal forms. On the basis of these observed resemblances, the old Hawaiians developed a systematic theory which considered forms (kino, body) having notable resemblances of particular sorts to be multiple forms (kino-lau) of one or another of the ancestral nature gods which mythology and tradition purported to be either (a) primordial, i.e., born of the union of Sky with Mother Earth, in these islands; or (b) proto-historic or historic migrants from abroad, or (c) native Hawaiians who, long ago became elevated to the rank of gods of high rank and power. For example, the edible tree-ferns which cover the uplands are

“bodies” of Haumea, who is Papa, Mother Earth herself. The sharks, on the other hand, are “bodies” of one of the brothers of Pele, goddess of vulcanism, who was an immigrant from abroad. Lizards seen today are related to a deified chiefess of the island of Maui who was a worshipper of the ancient goddess who was ancestress of all lizards, whose kino-lau all lizards are. Caterpillars are cousins of sea-cucumbers and baby eels, all descended, as his “multiple-forms,” from a nature god who rose from the bottom of the sea in an age long past.

The rationale of these old Hawaiian theories of nature will be plain, in the notes that follow, for anyone who can understand the logic-by-analogy of old Polynesian thinking. The significance of the theory of kino-lau in relation to the ‘ohana, as family and community, lies in the fact that these concepts form the basis of kapu affecting individuals and groups; while equally they serve psychologically as common denominators of descent, relationship, status and duty for the kindred affected.”

And so familial ties to the natural environment are a significant subject of concern, as are connections among community members. Vaughan and Vitousek (2013) describe in detail the subsistence fishing-driven connections that bind members of the Haena, Kauai community, connections forged by the *mahela* or distribution/sharing of fish caught locally by subsistence fishers. Specifically, the reciprocal, non-commercial sharing of locally caught fish promotes community resilience and sustainability by supporting perpetuation of cultural practices, food sufficiency activities, and maintenance of place-based knowledge and social networks. As described by Cajete (1999) and Berkes (1999) for other Indigenous communities, native Hawaiian relationships with the environment could not have come into existence or continue to exist for that matter, without reciprocal exchanges among community members, human and non-human. Accordingly, Hawaiians view themselves as younger siblings to the surrounding environment, and so are compelled to demonstrate filial piety via ritual and reciprocal exchanges. As with any familial relationship, the rules of aloha and malama apply: to love and care for all relations with the goal of creating abundance for current and future generations.

Hawaiian understanding of the universe is shaped by Hawaii’s geography, cultural traditions, and mythology, but also particular kapu and kanawai or resource and self-management tools, which ensure sustainable living on this land space. Kapu is the level of a person’s, place’s, or element’s sacredness, which is determined by a person’s, place’s, or element’s status and contribution to the Hawaiian social-ecological world. And Kanawai dictates

accessibility and behavior in proximity to the resource in order to preserve a resources kapu. Again, accessibility and behavior applies to relationships between natural phenomena, between natural phenomenon and kanaka, and between kanaka. These ideas, life ways, persist through the process of aloha: generating the “ability” to “sustain” our relationships (ALO) with reciprocity (HA), with the ultimate goal of creating abundance for current and future generations.

Weaknesses of Indigenous sustainability science include a high sensitivity to local knowledge, which in many cases is now held by very few traditional practitioners or land experts. Because of colonial activities, relocations forced and otherwise, introduction of diseases, cultural marginalization including outlawing practices and language, knowledge held by land experts has become fragmented and in some cases lost. This loss is now compounded by the fact that across planet Earth, the traditional knowledge tied to a location, and developed over millennia may no longer apply because degradation has changed the patterns and processes that had come to define a system. While local Indigenous knowledge systems are clearly defined by their capacity to evolve and adapt to change in a system, the extent, severity, and rapidity of degradation to the environment seen today are unlike anything witnessed in the history of humanity. As a result, and often out of necessity, most Indigenous communities participate in Western approaches to securing sustenance. Further, because Indigenous knowledge systems are relevant at local spatial scales, planning, implementing, or managing larger scale efforts requires investment into building substantial collaborative teams that may not be cohesive, at least initially (Berkes 2007).

A path to integration and thoughts on a way forward

There has been significant debate about the extent to which Western and Indigenous ways of knowing are dissimilar (Berkes et al. 2000), and we cannot resolve this debate here. However, we suggest that a starting point for integration is the same starting point for Indigenous sustainability science—using resources, yes, but in all cases with respect of the sacred and with caring for a resource that is to sustain current and future generations. This somewhat obvious starting point can provide critical insights into how individuals can rebuild relationships among members of a community, and how communities can rebuild relationships with the environment by addressing local ecological, social, and spiritual needs of all participants. This approach is eloquently captured by Johnson and Larsen (2013) who describe the need to embrace a deeper sense of place in the

study of how humans relate to their surroundings, with the important goal of decolonizing both perspectives and actions in research environments. And just as they highlight that “Indigenous ontologies structure worldly understanding through firsthand experience in place” and that “places speak to the recognition that context is essential for knowledge,” so too is a sense of place central to the integration of multiple knowledge systems in sustainability science (Vaughan 2014) and to achieving sustainability (Berkes 1999; Cajete 1999; Vaughn and Vitousek 2013). Only when people are in relationship with place and with resources can there be deepened connections between beings (plant, animal, physical, spiritual). And only when intimate connections are married to deep understanding can informed stewardship and passionate guardianship occur (Johnson and Larsen 2013). As the rich story of American conservation has demonstrated (Nash 2014), this marriage is a powerful engine of change, playing out over the past century in conservation success after conservation success. Mirroring Berkes (2007) and his treatment of community-based conservation of biodiversity, we propose that humanity’s sustainability crisis is also a multi-level problem of the commons, and its solution should rely on a broadly integrated, pluralistic framework found on an ethic of the sacred. And so management planning should yield context specific and community-based sustainability actions that are derived from collaborative deliberations among diverse partners who are intimate with and deeply invested in place (Vaughan and Vitousek 2013).

Integrating Western and traditional tools and approaches within an Indigenous place-based, relationship-driven framework may be an effective approach to fundamentally altering our patterns of consumption, widely viewed as being as critical a driver of global ecological degradation as population growth (The Millennium Assessment). To be intimately connected to sustaining resources would change how we view and interact with the world around us, what we purchase and why, and where and how we acquire our food. An integrated and pluralistic, place-based and relationship-driven framework would achieve (1) recovery the sacred nature of resource removal (Johnson and Larsen 2013); (2) focusing on managing for abundance and taking the minimum needed for survival thereby reducing damage caused to resources; and (3) enhancement of resource management oriented social networks. And so this approach has the potential to transform the physical quality (obesity, cancer, diabetes, etc.) and spiritual quality of our lives (fulfillment from connectedness to the resources that sustain us, our families and the communities that participate in resource stewardship and protection).

Critically, the folding of the sacred into larger scale resource management and conservation has also occurred in Western communities, and has been a central feature of

Western thinking about the natural world and the place of humans in that world. For example, Nash (2014) documents the very spiritual foundation of the North American conservation movement. Many of our most cherished conservation initiatives (e.g., the National Park System, The Wilderness Act) were achieved in large part because congressional and agency leadership and the public were aligned by a common appreciation for the sacredness of natural areas. Thinkers such as Ralph Waldo Emerson, Henry David Thoreau, John Muir, and Aldo Leopold contributed much to a sacredness ethic underpinning these advances, viewing our relationship to wildness resources as a sacred one that binds human to place. While this spiritually based, twentieth century conservation ethic represented a significant departure from that of early European settlers (utilitarian farmers who sought to subdue and convert wild areas to productive agricultural uses), was not universally embraced, and caused the dislocation of countless Indigenous communities (Nash 2014; Williams 1990), sacredness has been none-the-less a critical pillar in the history of American resource conservation (Leopold 1949; Nash 2014). Looking forward, Abram (1996) provides an eloquent summary:

“Ecologically considered, it is not primarily our verbal statements that are true or false, but rather the kind of relations that we sustain with the rest of nature. A human community that lives in a mutually beneficial relation with the surrounding earth is a community, we might say, that lives in truth. The ways of speaking common to that community—the claims and beliefs that enable such reciprocity to perpetuate itself—are, in this important sense, true. They are in accord with a right relation between these people and their world. Statements and beliefs, meanwhile, that foster violence towards the land, ways of speaking that enable the impairment or ruination of the surrounding field of beings, can be described as false ways of speaking—ways that encourage an unsustainable relations with the encompassing earth. A civilization that relentlessly destroys the living land it inhabits is not well acquainted with truth, regardless of how many supposed facts it has amassed regarding the calculable properties of its world.”

And so the task ahead seems to be how to identify the needs of our landscapes, redefine what it means to be in sustainable relationship with each other and our landscapes, and embrace the sacred in setting sustainability objectives—all the while knowing that further extinctions are inevitable, further degradation of ecosystem services impossible at least in the short term to avoid, and spiritual and social alienation increasingly the norm. Indigenous

sustainability science offers us powerful solutions on all these fronts—solutions that can be implemented immediately in the home by individuals of any community, and eventually by any community.

Because many of our sustainability problems are no longer solvable only by application of highly local, Indigenous knowledge-based solutions (Berkes 2007), incorporation of the tools of Western sustainability science into an Indigenous sustainability science framework with its own complement of traditional knowledge and tools holds great promise for both achieving larger scale sustainability but also transforming lives in a way not achievable in a market-driven commodity-based framework. This would require several changes: (1) Western sustainability science positions itself to embrace sustainability as something inseparable from human value systems where sustainability becomes a balanced manifestation of a community’s collective values as well as processes based on respect of the sacred nature of both living and non-living resources; (2) integrated perspectives on sustainability that lead to educated, inspired, and motivated individuals who make decisions with the goal of cultivating more meaningful, aloha-based relationships among people, within communities, and with the environment; and (3) societies that are more intentional about how value systems are constructed, evaluated, maintained, and modified, especially deemphasizing norms where financial health is valued over spiritual and ecological health and at the cost of personal and ecological wellbeing. Of course, there is an enormous need to support sustainability efforts that are seeking such integration in order to expand and document the processes, methods, curricula, and demonstrations required for integrating multiple knowledge systems in the management of sacred landscapes.

Until we meet again, generate aloha in every relationship. I ola ‘oe, i ola ia‘u nei!

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