Environmental Anthropology Engaging Permaculture: Moving Theory and Practice Toward Sustainability

James R. Veteto, and Joshua Lockyer

James R. Veteto and Joshua Lockyer are with the Department of Anthropology, University of Georgia, Athens, GA.

Abstract

Using a variety of theoretical rubrics, recent work in ecological and environmental anthropology has revealed that human–environment interactions within the context of global capitalism are complex and have increasingly unjust and unsustainable outcomes. As globalization proceeds and associated socio-environmental problems become clear, it is important that ecological and environmental anthropologists use empirical research to develop both theoretical and practical approaches to addressing the sustainability challenge. We suggest that an anthropological engagement with permaculture represents an especially timely opportunity for anthropologists to move toward sustainability in ways that complement and enable us to extend our traditional areas of theoretical and practical expertise. Permaculture is a development strategy that has a history of grassroots application, but it has been largely ignored by mainstream development practitioners and anthropologists alike. We argue that permaculture deserves a closer look. In this article, we trace the historical development of permaculture, provide examples of permaculture in practice in an ecovillage context, identify compatible areas of research within environmental anthropology, and make suggestions for engagement. [Keywords: permaculture, sustainability, agriculture, community, ecovillages, sustainable development, environmental anthropology]

Permaculture in Practice: One Anthropologist's Introduction

> It's a cool, blustery day at Earthaven, a young ecovillage settlement nestled into the eastern slopes of the southern Appalachians. Breaking through the rustle of wind in the trees are the sounds of human activity, of people building their common future together, of children at play. In the distance you can hear the Earthaven Forestry Cooperative's portable sawmill cutting lumber from trees felled on the land. This is the sound of liberation. The Co-op's sawmill is allowing villagers and neighbors to create shelter, freeing themselves from the clutches of banks and clear-cutting timber barons while keeping materials and money within the village economy. These are radical acts. Should these and other permaculture-based strategies take hold in the larger society, corporate control might someday yield to an empowered, responsible, ecologically literate citizenry. We can hope it will be in time to pull humanity back from the brink of disaster brought on by our own folly.
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> A major first-generation challenge for the Permaculture movement and one of the main reasons for the creation of Earthaven is to get enough working systems on the grounds that we can make informed choices based on actual experience and begin to model bioregionally appropriate culture for our time and place. Creating and integrating ecologically responsible forestry and agriculture while developing natural building systems that conserve forest health, create jobs and generate renewable energy through good design has proved to be quite an ambitious undertaking. That we are doing all these things while feeling our way toward just and sustaining social and economic relations and maintaining democratic self-governance within a new village context still seems nearly miraculous, the more so the longer we persist. [Marsh 2002:44]

In the fall of 2004, Lockyer initiated field research in an intentional community in the Appalachian Mountains of western North Carolina called Eartha-

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ven Ecovillage. Earthaven was founded in 1994 by a dozen people who started with a basic but ambitious goal of ''creating a holistic, sustainable culture.'' They bought 320 acres of land and decided to form a community where they could support each other in creating a different way of life, one that is more socially intimate and less dependent on an integrated unsustainable system of production and consumption. Today, Earthaven has grown to over 60 members, 45 of whom live ''on the land,'' gradually implementing social, cultural, political, economic, and technological experiments in sustainability. Compared with most Americans, Earthaven's members live more communally and much closer to the economic resources that sustain them. They own, steward, and govern their land collectively using unique forms of land tenure and consensus decision making. Although some of them live in individual residential dwellings, they come together to eat, socialize, and govern themselves in common buildings and spaces. Members share common waste processing and water distribution systems, which they construct and maintain themselves, in addition to producing as much of their own food, energy, and material goods as they can. Although the specific form of Earthaven's experiments in sustainable living might be unique, the concept of an ecovillage is not. The Global Ecovillage Network (GEN) is today tracking over 400 ecovillage projects around the world (GEN 2008). A description of this movement is beyond the scope of this paper and has been provided by Lockyer elsewhere (2007a and 2007b). However, the most commonly quoted definition of the term ecovillage is indicative of the lofty goals that motivate the people and communities that comprise the movement: ''Ecovillages are human-scale, full-featured settlements in which human activities are harmlessly integrated into the natural world in a way that is supportive of healthy human development, and which can be successfully continued into the indefinite future'' (Dawson 2006:13).

By aligning itself with the global ecovillage movement, the founders of Earthaven made it clear that they were committing themselves to exploring an alternative paradigm of development, an approach that takes responsibility for the effects of people's lifestyles and livelihoods on ecosystem function, and human health and well-being. However, this definition of ecovillage provides only an abstract outline of what Earthaven and other ecovillages like it are. How does one go about developing a full-featured settlement in which human activities are harmlessly integrated into the natural world? How does one create communities that can support healthy human development that can be maintained into the indefinite future? As is true of any sustainability movement, achieving such goals will require significant forethought, risk-taking, and expertise. As many anthropologists would likely agree, achieving sustainability entails actions grounded in detailed knowledge of local ecological, political–economic, and socio-cultural systems combined with a global awareness and scientific acumen. But how is one to bring all of these components together in a way that makes sense and can lead to practical action?

> Permaculture is a holistic system of DESIGN, based on direct observation of nature, learning from traditional knowledge and the findings of modern science. Embodying a philosophy of positive action and grassroots education, Permaculture aims to restructure society by returning control of resources for living: food, water, shelter and the means of livelihood, to ordinary people in their communities, as the only antidote to centralized power. [Permaculture Activist 2004:3]

The above quotation is on the inside cover of every edition of *Permaculture Activist* magazine, a publication that was edited by one of Earthaven's members during the time of Lockyer's fieldwork. As initial participant observation at Earthaven Ecovillage progressed, it became apparent that the permaculture paradigm provided a practical foundation for members to reach their goal of developing a holistic, sustainable culture. Indeed, permaculture's ethical philosophy and material design principles provided the tools for translating the ecovillage concept from idealism into practice. At Earthaven Ecovillage, permaculture has been used as one of the main tools for building bridges between global social and environmental awareness and concern and the development of local, sustainable practices.

According to their website:

> One of our first tasks was to create a permaculture-based site plan for developing our mountain forest property. We identified sacred sites; land to remain forested; areas for gardening, farming, and orchards; locations for ponds and hydro-power stations; locations for roads, paths, and common

community buildings; and locations for residential neighborhoods. We agreed to build homes only on slopes and save flat bottom land for agriculture; retain as much water on the land as possible through roof water catchments, swales, and ponds; regenerate our soil with layers of organic biomass; protect our sacred sites; and not build on ridge tops. We build passive-solar heated buildings of natural Earth-friendly materials and generate our own off-grid power. We practice sustainable forestry and preserve many of our wilderness areas. We are not yet growing and raising most of our own food; however, this is important to us and is one of our next steps. [Earthaven Ecovillage 2008]

Although Earthaven is by no means a purist rendering of permacultural thought in action, time spent there does make it clear that the permaculture paradigm provides a holistic and common-sense approach that recognizes humans as an integrated part of ecosystems. Permaculture challenges humans to take responsibility for themselves and the economy that sustains them by designing and practicing permanent, sustainable cultural and agricultural systems created in accordance with environmental knowledge.

A Historical and Conceptual Overview of the Permaculture Paradigm

Permaculture is a global grassroots development[1] philosophy and sustainability movement that encompasses a set of ethical principles and design guidelines and techniques for creating sustainable, permanent culture and agriculture. Indeed, permaculture is an agglomeration of these three words: permanent, culture, and agriculture. Permaculture models its designs for agroecosystems, buildings, and communities on patterns observed in nature, but perhaps more importantly, permaculture views humans and their creations and activities as part of the natural world. Rather than focusing on human creations—agroecosystems, buildings, and communities—permaculture emphasizes the interconnections among these creations, humans, and the natural world. Permaculturists believe that this focus on interconnections is the best way to create systems that function in a sustainable manner. Permaculture is an eclectic and adaptive approach that emphasizes local and bioregional perspective and practice. At the same time, it is informed by a global view, maintains a strong tradition of technology and knowledge transfer across diverse areas and cultural traditions, and is fundamentally based on empirical observation and experimentation.

These foundations came into being in the 1970s when it became increasingly clear that the prevailing model of development was not creating ecologically sound, economically prosperous communities and was, to the contrary, actively destroying such communities. The conceptual and practical rubric for permaculture was initially developed in Australia by Bill Mollison and David Holmgren beginning in 1974. In Mollison's words, they ''jointly evolved a framework for a sustainable agricultural system based on a multi-crop of perennial trees, shrubs, herbs..., fungi, and root systems, for which I coined the word 'permaculture.' We spent a lot of time working out the principles of permaculture and building a species-rich garden'' (1991:preface). The result was the publication in 1978 of a detailed volume entitled *Permaculture One* (Mollison and Holmgren 1978), a work that still stands as a permaculturalist's bible.

The academic response to Mollison and Holmgren's work was mixed, but largely negative; the disciplinary specialization of the academy was not prepared for the holistic approach that they offered, even in the face of the emerging and increasingly acknowledged socio-environmental crisis. The academic world would have to wait some 20 years before interdisciplinary work became a dominant research paradigm—permaculture was way ahead of its time. Mollison's words again: ''The professional community was outraged, because we were combining architecture with biology, agriculture with forestry, and forestry with animal husbandry, so that almost everybody who considered themselves to be a specialist felt a bit offended'' (Mollison 1991:preface). Similarly, Holmgren notes that ''permaculture was conceived within academia. Many who are involved in large-scale agriculture and land use policy saw it as theoretical, utopian and impractical because it was difficult to apply within the prevailing social, market and policy environment'' (Holmgren 2002:xxii). Although permaculture has been taken seriously by some academics, resulting in occasional sporadic publications over the years (e.g., Jungt 1985; Kennedy 1991; Strange 1984a, b), it has largely been ignored. This is particularly the case in anthropology, where little or no literature exists.

However, the public reaction was quite different; small-scale agriculturalists especially gravitated toward

Mollison and Holmgren's ideas as they sought a more ecologically sound approach to food production. In the late 1970s, Mollison resigned from his university post and committed himself full time to experimenting with teaching and promoting permaculture design. By 1981, Mollison had garnered a Right Livelihood Award (Alternative Nobel Prize) and had graduated an initial group of people from a standardized permaculture design course that he taught in Australia. These graduates moved on to teach others, initiating a pattern that continues to this day that has resulted in at least 100,000 trained permaculture practitioners throughout the world (Holmgren 2002).

The permaculture movement today is represented by an eclectic network of local practitioners and demonstration centers and by a number of publications such as *Permaculture Activist* magazine. Semi-structured permaculture design certification courses are offered throughout the world based on a curriculum that was codified in 1984 (Holmgren 2002). These courses are often hands-on events that take place at permaculture experimentation and demonstration sites such as Earthaven Ecovillage, sites created by people who can often trace their permaculture genealogy back to Bill Mollison and David Holmgren. People who participate in these courses often find them "life-changing" and go on to establish their own permaculture experiments and demonstration centers. The semi-formalized structure of permaculture certification has created some concerns regarding lack of standardization. However, the flexibility inherent in this horizontal approach is valued because it allows the core of the permaculture rubric to be adapted to widely varying cultural and ecological contexts. According to Holmgren, permaculture is represented by "a worldwide network and movement of individuals and groups who are working in both rich and poor countries on all continents to demonstrate and spread permaculture design solutions. Largely unsupported by government or business, these people are contributing to a more sustainable future by reorganizing their lives and work around permaculture design principles" (Holmgren 2002:xx).

While Mollison, now in his eighties, has become less active in the movement, Holmgren continues to promote permaculture as a powerful, common-sense approach to sustainability and an antidote to "the prevailing industrial culture" (Holmgren 2002). In his recent book, *Permaculture: Principles and Pathways Beyond Sustainability*, Holmgren defines permaculture as follows:

> Consciously designed landscapes which mimic the patterns and relationships found in nature, while yielding an abundance of food, fibre and energy for the provision of local needs. People, their buildings and the ways they organise themselves are central to permaculture ... It draws together the diverse ideas, skills and ways of living which need to be rediscovered and developed in order to empower us to move from being dependent consumers to becoming responsible and productive citizens. [Holmgren 2002:xix]

Holmgren's book emphasizes both the ethical philosophy and the design principles that together comprise the permaculture rubric.

Permaculture begins with a set of ethical principles that are based on some fundamental assumptions. "The environmental crisis is real and of a magnitude that will certainly transform modern global industrial society beyond recognition. In the process, the well-being and even survival of the world's expanding population is directly threatened" (Holmgren 2002: xv). In addition, "the inevitable depletion of fossil fuels within a few generations will see a return to the general patterns observable in nature and preindustrial societies dependent on renewable energy and resources" (Holmgren 2002:xvi). With these assumptions in mind, permaculture seeks to enable people to become more self-reliant and, in the process, to relieve the social injustices and ecological degradation created by the global political economy. In this aim, permaculture's critique of the modern, Western, industrialized political economy and culture is clear.

> The fact is that our own comfort is based on the rape of planetary wealth, depriving other people (and future generations) of their own local resources. Our own "hard work" and the so-called "creativity" of our economy and "fairness" of our system of government are all secondary factors in creating our privilege. Once we understand the massive structural inequities between rich and poor nations, urban and rural communities and human resources and natural resources, the emphasis on providing for one's own needs is seen in a different light. *As we reduce our dependence on the global economy and replace it with household and local economies, we reduce the demand that drives current inequities. Thus "look after yourself first" is not an invitation to greed but a challenge to grow up through*

self-reliance and personal responsibility. [Holmgren 2002:7, emphasis added]

At a fundamental level, permaculture holds that ''the process of providing for people's needs within ecological limits requires a cultural revolution'' (Holmgren 2002:xxv).

Based on this cultural critique and utopian vision, permaculture combines insights gleaned from traditional ecological knowledge and modern scientific knowledge into designs for sustainable human settlements and production systems. As mentioned before, the core of the permaculture paradigm consists of a basic ethical philosophy and a set of design principles or guidelines. Permaculture's three ethical principles are basic and fundamental: (1) care for the earth, (2) care for people, and (3) set limits to consumption and reproduction and redistribute surplus (Holmgren 2002). These ethical principles are grounded in the assumptions discussed above and provide a permacultural foundation for designing and enacting a more just, equitable, and sustainable world.

Permaculture's design principles, initially presented in Mollison (1991) and recapitulated in Holmgren (2002), are grounded in the science of ecology, and more particularly in systems ecology, landscape geography, and ethnobiology (Holmgren 2002). The overall aim of these design principles is to develop closed-loop, symbiotic, self-sustaining human habitats and production systems that do not result in ecological degradation or social injustice. Although the design of such systems is necessarily dependent on the particular local context, the permaculture rubric provides general guidelines for considering environmental variables and patterns in designing buildings, home gardens, orchards, farms, livestock operations, aquaculture systems and community, and urban areas (Mollison 1991).

While we do not have space here for an extensive discussion of all 12 permaculture design principles, we provide an example of each principle in action at Earthaven and refer the reader to publications such as *Permaculture Activist* and to the published work of Mollison and Holmgren (Holmgren 1996, 2002; Mollison 1988, 1991; Mollison and Holmgren 1978;) for further elaboration. Permaculturalists believe that these principles provide a framework for situating humans in nature as we seek a sustainable development strategy. This framework is a foundation for experimentation in places like Earthaven, where an adaptive management approach is leading to the creation of an increasingly self-reliant ecovillage.

Permaculture Principles and Practice at Earthhaven

(1) *Observe and Interact*: Earthaven's founders spent over a year observing their property, becoming familiar with the flows of energy—wind, solar, and water—across the landscape, before they began developing the ecovillage. This process continues to this day as they recognize and learn from their mistakes and seek to more fully integrate their human community into the natural community of their property and bioregion.

(2) *Catch and Store Energy*: Renewable energy systems are the most obvious example of this principle in practice at Earthaven. From photovoltaic solar arrays to their micro-hydro generating station, Earthaven's members capture and store readily available energy. The same could also be said of the gravity-fed water distribution system that uses the force of gravity rather than fossil fuel-powered pumps to deliver water to households and other facilities throughout the ecovillage.

(3) *Obtain a Yield*: Earthaven manifests this principle on a very local scale. They have a long-term, ecologically sensitive forest management plan for their property under which they harvest wood and use it in the construction of their own houses. A variety of agro-ecological production systems are also being developed so that Earthaven's members can begin to provide for their own food needs.

(4) *Apply Self-Regulation and Accept Feedback*: Referring back to principle one above, Earthaven's members are constantly involved in reevaluating what they have done in terms of the physical development of their land. Regular meetings of the strategic planning committee provide opportunities to change course or choose another development strategy that seems more appropriate based on recent experience. For instance, Earthaven has chosen to stop allowing the development of outlying neighborhoods until the center of their community has become more fully functional, recognizing that this pattern had led to the fragmentation of their social

community because they had subconsciously copied the unsustainable suburban model in which most of them were raised.

(5) *Use and Value Renewable Resources and Services*: Again, the obvious manifestation of this principle is Earthaven's renewable energy systems, primarily photovoltaic solar and micro-hydro. However, this principle is also apparent in Earthaven's emphasis on composting food scraps and human waste for use as future fertilizers, completing a more closed-loop nutrient cycle.

(6) *Produce No Waste*: The emphasis on compost in principle five above is an excellent illustration of this principle in action at Earthaven. However, Earthaven has taken this a step further in terms of putting society's waste to good use. For example, a large house at Earthaven that often serves as a bed and breakfast for visitors was constructed using parts from a dismantled bridge and frozen fruit juice concentrate shipping pallets that were destined for the local landfill.

(7) *Design from Patterns to Details*: A pattern that is evident anywhere on Earth is the sun's cycle throughout the year and many cultures have oriented their architecture around this cycle. Earthaven requires all of its buildings to be built using a passive solar orientation; that is they are designed to absorb the sun's rays when it is low in the southern sky during the winter, providing natural renewable heat for the home, and to reflect sunlight during the hotter months. However, this has not led to an orthodoxy of building style; rather each building, while being oriented for passive solar gain, is designed uniquely for its particular site in the landscape and its particular occupants.

(8) *Integrate Rather Than Segregate*: Industrial agricultural systems are characterized by large-scale fields of monocrops. Earthaven's approach is to use a variety of inter- and multi-cropping methods to enhance pest control and soil regeneration. Beyond that, Earthaven has moved toward a reintegration of natural and agricultural systems through the creation of a ''forest garden'' where food crops are interspersed with existing, partially harvested forest.

(9) *Use Small and Slow Solutions*: Earthaven itself is a small and slow solution. It has taken 15 years to put in basic, minimal infrastructure, establish a system of communal self-governance, build a few dozen buildings, and begin small-scale food production. This stands in contrast to the rapidity of suburban construction, suggesting that small and slow approaches are inherently more sustainable and more fulfilling.

(10) *Use and Value Diversity*: Many of Earthaven's members know their landscape intimately. During Lockyer's fieldwork at Earthaven, there was a group of young men who would regularly go out for ''plant walks'' during which they would identify as many different species as they could. On one particular occasion, they returned with specimens of over 20 types of edible mushrooms. This reflects a wider pattern at Earthaven whereby ecovillage members know how to identify and use the biological diversity that exists on their property.

(11) *Use Edges and Value the Marginal*: Many of Earthaven's buildings are built on slopes that mainstream builders would consider marginally appropriate. However, Earthaveners have chosen to turn this problem into an opportunity, taking advantage of natural features such as south-facing slopes to build passive solar-oriented houses. With regard to edges, many of Earthaven's farmers use the edges of their fields (where there are defined fields) to plant flowers that are simultaneously esthetically pleasing and act as a form of pest control or edible plants and trees such as wineberries (*Rubus phoenicolasius*) or hazelnuts (*Corylus avellana*).

(12) *Creatively Use and Respond to Change*: One of the biggest changes that has taken place at Earthaven is an influx of younger members of little financial means. Earthaven's founders were mostly older and many of them had significant financial resources. Under the original membership process, buying into the community required a significant financial investment. When these younger, poorer people began arriving in higher numbers, Earthaven's members made a consensus decision to open up a ''sweat equity track''

to membership and landholding. This enabled people of lesser financial means to pay their membership and site lease fees by contributing labor to community agricultural projects, thus enabling a larger, more diverse membership and simultaneously moving Earthaven's much desired agro-ecosystems forward.

Permaculture Elsewhere

As a result of the growth of the permaculture network, permaculture principles are increasingly being employed by individuals, communities—intentional and otherwise—and even local and national governments (Cuba, Vietnam, Brazil) in the development of more just, equitable, and sustainable human habitations, communities, and agricultural production systems. The permaculture paradigm represents one path among many that should be explored as society seeks to address impending socio-environmental crises. As environmental anthropologists, we recognize that current models of development are on an unsustainable trajectory and we advocate for more socially just and ecologically sustainable forms of development. However, too often our critiques of current approaches to development are unaccompanied by viable solutions, especially solutions that recognize that we in the Global North must take responsibility for our contributions to contemporary socio-environmental problems. One reason for this is that suggesting such solutions entails a political agenda that clashes with our role as supposedly dispassionate scientific researchers. One way around this conundrum is the strategic choice of research foci. As social scientists we can choose to focus our methods and theoretical frameworks on people who have taken the politically active step of saying ''no'' to current development hegemonies and experimenting with alternative development strategies.

We hold that the permaculture movement acts as a sort of a natural laboratory wherein potentially sustainable solutions are experimented with. Further, we believe that by engaging with this movement, we can create a powerful dialectic between anthropological theory and practice on the one hand and cultural critique in action for sustainability on the other. Engaging in this dialectic, we seek to help construct an anthropology that can productively contribute to an understanding not only of how the world is and how it got that way but also of how the world could be and how we can get there.

Engaging Permaculture: Areas of Theoretical and Applied Compatibility

There are numerous promising theoretical and applied perspectives within environmental anthropology that present potential cross-fertilization opportunities with permaculture. We identify those perspectives and give some preliminary suggestions for collaboration before concluding with suggestions for how this sort of collaboration can provide a direction for anthropology. Examples and discussion are also presented that make a case for narrowing the gap between sustainability practices and academic ideals.

Several research programs in environmental anthropology offer excellent opportunities for permaculture-based scholarship and practice. Although certainly not limited to these approaches alone, this section will focus on cultural ecology, agricultural anthropology, historical ecology, ethnoecology, and political ecology as particularly fruitful avenues for engaging permaculture.

Cultural ecologists have focused their research on three fundamental questions: (1) How does [a certain cultural group] make a living? (2) How do they organize themselves to make that living? and (3) How do they rationalize the way they make that living? Although cultural ecology is no longer a dominant approach within anthropology (it is still a major research strategy in geography), its focus on environmental adaptations of different groups of people in different places of the globe from the 1950s to the 1980s produced an impressive amount of empirical data (e.g., Bennett 1969; Netting 1968, 1981, 1993). Ethnographic data, particularly with respect to smallholder agriculture, are exactly the type of empirical information that permaculturalists can use in their applied approach to bioregionally sustainable adaptations. Whether it be Chinese smallholder agricultural strategies spanning thousands of years (Netting 1993), Andean, Alpine, and Himalayan adaptations to alpine mountainous areas of vertical zonation (Rhoades and Thompson 1975), or the complex adaptive strategies of different social groups to the Canadian Plains (Bennett 1969), cultural ecologists have outlined in substantial detail how people have managed to survive in ways that inform us about sustainability. A cultural ecology database made available for anthropologists engaged in permaculture research and application as well as to permaculture practitioners would be of immense practical value. This database has the potential to ground permaculture projects and can give cultural ecologists

a productive new framework in which to apply and interpret their research.

Agricultural anthropology, a relevant subdiscipline that has drawn on cultural ecology, has excellent potential for contributing to the understanding and improvement of permaculture and vice versa. It has been prominent in international agriculture and development circles and has contributed to the emergence of horizontal and participatory development approaches such as ''farmer back to farmer'' (Rhoades and Booth 1982) and ''farmer first'' (Chambers et al. 1989). Long-term experimentation in agricultural anthropology with more egalitarian research relationships provides methodologies that can be applied in permaculture settings (Rhoades, 1984). Sustainable and alternative agriculture is also a current major research focus for agricultural anthropologists. Permaculture, with its emphasis on designing sustainable agroecosystems, has been understudied but has much to add to the knowledge and practice of agricultural anthropology, particularly with regard to creating a multilayered perennial polyculture agriculture.

The merging of historical ecology with permaculture can provide practitioners with long-term data on how human–environment interactions have taken place in specific places. A central concept used to organize historical ecology approaches to human behavior and agency in the environment is *landscape*, a term that has is its origins in historical geography. Landscape is also the multiscale domain that permaculture takes as its field of operation (Mollison 1988). Therefore, historical ecology and permaculture are theoretically aligned on at least one basic level. Both permaculture and historical ecology have a shared interest in the applied realm, as applied historical ecologists are cognizant of their role in supplying baseline data related to time depth and traditional knowledge that can be used to restore past landscapes (Baleé 2006; Swetnam et al. 1999). Similarly, permaculturists seek to improve the sustainability of present landscapes through various design principles. A major finding within historical ecology is that human cultures do not always reduce environmental landscapes into barren wastelands of low diversity. Rather, human communities often heighten species diversity in local environments through ongoing resource management strategies that increase landscape heterogeneity—particularly local and indigenous gardening and agroforestry practices (Baleé 2006; Fairhead and Leach 1996). Species increases through time, by human intervention in specific landscapes, is consistent with permaculture design principles, which seek to maximize species diversity and stability to provide for basic human needs (Mollison 1988). Permaculturalists can take information gleaned from historical ecology to weigh their design options, particularly when deciding whether or not certain architectural plans, agroecological designs, or plant species are contextually appropriate. In short, historical ecology offers data that can help applied permaculturalists learn from the past, while permaculturalists can provide historical ecologists unique and diverse natural laboratory settings to see how their findings are applied to landscape design.

Ethnoecology is another subfield that offers opportunity for collaboration with permaculture. In the past 60 years, ethnoecological research has produced a wealth of studies featuring indigenous ecological knowledge systems. This diverse variety of ethnoecological studies can help permaculturalists to garner ideas about the application of their own and borrowed technologies and practices. Furthermore, the study of indigenous classification systems and behaviors (Berlin 1992; Ellen 2005, 1993) can help permaculture practitioners challenge their own conceptualizations of the biological world from perspectives outside of the western tradition. Anthropological challenges and debates surrounding the appropriation of indigenous materials and intellectual property rights can also help to insure that cultural borrowing is appropriately contextualized, acknowledged, left alone if needed, traded, or compensated for (Agrawal 2002; Cleveland and Murray 1997; Dewalt 1994; Sillitoe 1998, 2006). Ethnoecologists can also study permaculture sites as dynamic cultural arenas and natural laboratories, where people in various bioregions across the world are incorporating, classifying, reclassifying, and hybridizing locally appropriate technologies and biological knowledge. This seems to be an important step for ethnoecology to contribute on-the-ground solutions toward sustainability.

Political ecology has brought issues of political economy and power to the forefront of ecological approaches that have been apolitical in their traditional forms (Robbins 2004). Approaches such as world systems theory (Wallerstein 1974) and poststructuralism (Escobar 1999) point out how limited access to and control over resources—combined with the essentializing tendencies of ''otherness''—tend to disempower individuals, communities, and the envi-

ronments in which they dwell. Analysis has centered largely on the relationship of governmental and corporate power/capital hegemonies in the Global North to nations and communities on the periphery of the capitalist world economy, particularly in the Global South. The political ecology approach articulates well with permaculture ethics and cultural critique that encourage modern individuals to take responsibility for their own actions, reduce their consumption and waste, and live a more simple and ecological lifestyle, thereby enacting a more democratic and fair division of and access to the world's environmental resources (Holmgren 2002). Both permaculture and many prominent strains of political ecology are engaged in a critique of current globalization trends emerging from a capitalism whose political power is centered in the Global North. Permaculture offers political ecology the opportunity to study how citizens, particularly in the Global North, are providing lifestyle and community changes to meet the sustainability challenge and inherent inequalities in the current global economic system.

Discussion

Fictional Scenario 1:

An environmental anthropologist gets up in the morning, takes his customary 20-minute hot shower, throws on his best five hundred dollar suit (one of over 25 suits he has accumulated over the years), walks out his two-story suburban house and jumps in his SUV, quickly navigating the 30-minute drive through rush hour to take care of a few things in his university office. After packing his briefcase with the necessary papers, he jumps back in the SUV and makes the hour long trek to the nearest regional airport. As usual, breakfast is eaten on the run through a McDonalds drive-thru with an order of a bacon, egg, and cheese mcmuffin, a hashbrown, and a cup of coffee. NPR plays on the radio on the way to the airport which gives him short snippets of global events. This will be the last of 18 round-trip flights he has makes this year. Several hours later the plane touches down in Washington, DC. Outside the terminal he catches the first taxi ride available and tells the cab driver from Nigeria to take him directly to the five-star hotel where the American Anthropology Association Meetings will take place. By the time he and several thousand other anthropologists complete their weekend trips, they will probably have consumed more resources than many of the communities that they study will use in a year.

Fictional Scenario 2:

An environmental anthropologist gets up in the morning, takes her five-minute solar hot water shower, and puts on her just-casual-enough/just-business-enough hemp/organic cotton sweater that was made by the homespun seamstress in the ecovillage. She cooks a quick pot of oatmeal (purchased in a bulk order from the village co-op) and checks email on her solar powered laptop. The fair trade coffee is done just in time and she pours it into her trusty to go mug and hops out the front door of her passive solar cob house. She walks past several other residences (one post-and-beam passive solar and the other cordwood construction, both built by the ecovillage forestry co-op) and then out through the extensive village gardens and orchards. She swipes a limbertwig apple from a nearby tree and picks a few kale and mustard greens to chew on. She waves to two of her graduate students who are collecting data for their applied research projects as she gets in the community hybrid SUV that she has reserved for her drive to Washington, DC. She picks up several of her colleagues at the department and within 30 minutes they are on the road. It is a four and half hour drive, but within the eight hour radius of a pact they have made with each other for their one conference presentation a year. This may not be the best way to get ahead in their profession, but it sure does make their life less hectic and keep their ecological footprint down. A Global Ecovillages compilation CD plays in the background as they head to the AAA meetings. They had heard that this year the anthropology and environment section of the AAA had made some real progress in reducing the waste produced by the annual meeting and each of them was curious to see what had been done.

These two fictional scenarios depict two opposite extremes of a continuum and serve to illustrate a point. We all probably know at least someone who (at least loosely) fits the description of fictional scenario 1. It is fairly unlikely that we know anyone who fits scenario 2 (although not completely out of the realm of possibility), even if we may know several anthropologists who would ideally live in such a way. Most of us probably fit somewhere in between these extremes, navigating the constraints of our personal and professional lives to try and be as minimally wasteful as we can. Perhaps a minority of anthropologists do not care how much they consume and are explicit about their wasteful choices. We will not judge them here and it certainly does not mean they cannot produce excellent research and theory. But our call for a dialogue between anthropology and permaculture will probably be of much more use to those who are interested

in the greening of our profession and to some extent ''practicing what they preach.'' Taking responsibility for our own personal consumption patterns and demonstrating to others in our consumption-oriented culture that an environmentally sustainable future is a very real alternative development option is a major promise of the engagement between permaculture and environmental anthropology. It has the potential to bring us down to earth onto a more level playing field with the subjects of our research as well.

Permaculture, at present, is not a significant approach in the international agriculture centers (CGIAR) and other international development arenas such as the World Bank. We propose that it should probably remain so because permaculture provides an alternative, bioregionally organized, horizontal network of practitioners, ecovillages, and research sites that we feel would only suffer in the context of the current top-down (despite significant strides made toward more participatory bottom-up approaches) international development approach. Anthropologists who want to work in sustainable development and agriculture outside of the CGIAR and other such mainstream development arenas may find permaculture a suitable venue. The significant theoretical insights, applied experience, and grant-writing skills of anthropologists would almost certainly be a welcome addition to the international permaculture network. Decades of anthropological insights gained from the fields of political ecology and ethnoecology can help to caution permaculturists against potentially unethical cultural borrowings by bringing to light current debates concerning indigenous environmental knowledge (IEK) (Cleveland and Murray 1997; Sillitoe 1998). Conversely, permaculture in practice potentially gives anthropologists an on-the-ground forum for working out the often controversial, theoretical, and ethical implications of IEK in a more decentralized, grassroots fashion.

Applied projects led by anthropologists have already been instrumental in promoting sustainable agriculture on-campus (Barlett and Chase 2004) and in local U.S. communities (Andreatta 2005). Permaculture projects led or participated in by anthropologists hold a lot of promise for further research that goes beyond the current sustainability framework. In the future, it may be possible for anthropologists to walk out their front door and enter the (eco) village instead of having to fly halfway around the world to get there. When that happens, it may then be possible to speak of a true ''global village'' and reach out in more democratic ways to those with whom we conduct research.

Note

1. Development is used here for lack of a better word. The general idea of development—the improvement of the human condition—retains its value. However, development has become synonymous with a certain kind of development, one based on distinctly Euro-American, socio-cultural, and political economic models and one driven by the dictates of global capital. Most permaculturalists would undoubtedly balk at the cultural baggage carried by the concept of development; however, we do not have space to debate the viability of the term here.

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