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Ecovillages: Information Tools and Deeply Sustainable Living
Chapter 6

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A slow drumbeat reverberates across the wooden floor, signaling the Council of All Beings to assemble. Bear, Vole, Earthworms, Flower and Weed, Red-Tailed Hawk, Owl, Prairie Grass, Pond, and the rest of the wildlife representatives gather, circling around the drummer. Behind paper masks decorated with feathers, grass, and leaves are community members in the midst of planning a new housing development. Their decisions will shape the dwellings, gardens, workshops, laundry facilities, and common house that will provide shelter, food, and creative space for their community. Today's ceremony is an opportunity for community members to reflect on the influence that human development will have on the long-term future of the creatures with whom they share the land.

Four participants remove their masks, move to the center of the circle, and sit on the floor with backs together. They face outward, looking into the masked faces that represent their nonhuman neighbors. The four in the center represent humanity preparing to build on the land. Today, they put aside their drafts, applications, and permits to listen compassionately to beings who share their land and will be affected by their choices. One by one, each of the beings in the outside ring gives voice to feelings of fear and depredation: “My young will have no long grass in which to hide”; “Your heavy machinery will destroy my burrow”; “Where will we go for food if you fence, pave, and build on what little land is left?” At regular intervals, the human representatives in the middle switch places with four from the outer circle. The ones leaving the inner circle don their masks and resume their nonhuman roles. Those entering the inner circle “become human” and are tasked with the simple activity of listening. They are not to explain or defend their development plans, they just listen.

Who are these middle-aged white folks sitting on the floor on a chilly winter morning, wearing construction paper masks, pretending to be creatures from the land, sea, and sky? As a group, they represent Brook Ecovillage,¹ an intentional community formed in the Pacific Northwest of the United States. As individuals, they represent a variety of professional roles including educator, theater activist, pediatrician, facilitator, social worker, psychotherapist, politician,

massage therapist, translator, human resources manager, secretary, architectural designer, technical writer, administrator, and building contractor. In community outreach materials, the villagers describe themselves as individuals who are deeply concerned about the future of planet earth and the creatures that inhabit it, including human beings. Why are they pretending to be nonhuman life forms?

They are engaged in a ceremony developed by self-described ecophilosopher Joanna Macy, who states that

The Council of All Beings is a communal ritual in which participants step aside from their human identity and speak on behalf of another life-form. A simple structure for spontaneous expression, it aims to heighten awareness of our interdependence in the living body of Earth, and to strengthen our commitment to defend it. The ritual serves to help us acknowledge and give voice to the suffering of our world. It also serves, in equal measure, to help us experience the beauty and power of our interconnectedness with all life. (Macy, 1998, p. 1)

Members of the community identified Macy's ceremony as a way to envision the influence that the development of their ecovillage might have on the life forms with whom they share their immediate environment.

I too had a mask on during the Council of All Beings. My awkward paper beak kept slipping down my nose, a physical reminder of my challenge to keep up

with my various roles in the community. In the role of Seagull, I asked the villagers to consider how the building materials they use would influence my ability to find a safe place to nest and to find toxin-free grubs for my young. Behind the mask, my other roles in the community included student, friend, and researcher. As a researcher, I was asking the villagers to help me understand whether their goal to develop a sustainable lifestyle influenced how they use tools to create, share, store, and search for information. What, if anything, can we learn from their practices? Are there hints that might help us, as a technological species, move toward more sustainable interactions with and through information tools? This chapter describes an ethnographically informed project in which I set out to investigate whether there was evidence that people who are trying to live by an explicit set of values related to sustainability adapt their use of information tools to reflect their values better. Do they create a sustainability-oriented information ecology? To investigate this line of inquiry, a type of intentional community—ecovillages—was selected as a site in which a values-based, sustainability-oriented information ecology would most likely be found. Before embarking on the project, I visited a number of sustainability-oriented intentional communities and was impressed by their high levels of innovation. Community members creatively adapted tools and their use of these tools to better support values that are related to sustainability—for example,

converting an old refrigerator into a food dehydrator, retrofitting an old bicycle to serve as a wheat grinder, sharing three cars (two of which ran on vegetable oil) among 45 people. I strongly believed that by spending extensive time in similar communities, I would be exposed to innovative adaptations related to the use of information tools.

Throughout the project, ethnographic methods were employed to document the adaptive process. Data collection at two ecovillages included participant observation, semistructured interviews, information tool ownership and demographic surveys, and the collection of a range of community artifacts. I attended business meetings, discussion circles, meals, and work parties. I spent over 100 hours digging, hauling, planting, watering, weeding, and harvesting on the grounds of both communities. I listened, sang, and laughed during ceremonies, celebrations, and workshops, all while collecting data and learning. Informed by concepts from grounded theory (Glaser & Strauss, 1967), analysis of the data took the form of an iterative process of observation leading to the inductive analysis of data, which circled back to more observations and further analysis. The specific analysis of the various forms of data listed above was undertaken in the analytic ethnography tradition (Lofland, 1995; Snow, Morrill & Anderson, 2003). For the purposes of this chapter, high-level tensions between information tool use and community values are identified and discussed.

A Technological Species

Across the globe on college campuses, in parks, and in transportation hubs, increasing numbers of people plug into electronic devices with earpieces and avert their eyes from those around them. You see countless digital information tools (such as cell phones, smart phones, laptop computers, and portable media players) that help people communicate with others, entertain themselves, and even engage in research. This attraction to information tools is not a new phenomenon. Older, nondigital information tools (such as paper books, print newspapers, radios, and televisions) have helped generations of humans engage in communication, entertainment, and educational activities. However, digital information tools offer an enormous variety of features that engage our senses in many different ways. The ubiquitous presence of these highly interactive tools is not without unintended consequences. Researchers are voicing concerns about the effects of engaging with interactive devices rather than with our natural environment (e.g., Kahn, Severson, & Ruckert, 2009; Pergams & Zaradic, 2006). Others point to the wide-ranging and serious ecological repercussions of our growing dependency on digital information tools (e.g., Grossman, 2006; Kohler & Erdmann, 2004; Montalvo & Hawkins, 2009). These influences cut across economic, social, ecological, and cultural spheres.

Terminology: Information Tools, Values, and Ecovillages

Before delving further into the specifics of the project, definitions of three key terms may help the reader. First, information tools are broadly defined herein as artifacts for creating, recording, organizing, storing, manipulating, and sharing information. The term information tool is preferred to the terms information technology (IT) and information and communication technology (ICT) because the inquiry is not limited to digital information technologies. Examples of information tools that are included in this investigation are bulletin boards, chalkboards, cellular phones, laptops, and proposal books.

The second term that needs explication is ecovillage. One early definition describes them as “examples of what it means to live in harmony with nature in a sustainable and spiritually satisfying way in a technologically advanced society” (Gilman & Gilman, 1992, p. 3). Members of these communities incorporate composting, gardening, shared cars, shared meals, consensus decision making, and community-wide ceremonies and celebrations into their daily routine. They are critical of mainstream practices, and by rethinking many taken-for-granted interactions with tools, they are trying to develop a more sustainable lifestyle. Attention is given to which tools to acquire, where the tools are purchased, who owns them, how they are used, and how they should be handled when they are no longer deemed useful. But the concern for sustainability is not limited to efforts to

reduce the direct ecological impacts of a certain tool or behavior. The ecovillage literature suggests that spiritual, economic, and social influences must also be addressed to achieve a level of deep sustainability (Bang, 2005; Global Ecovillage Network, n.d.; Jackson & Svensson, 2002).

The third term that may cause confusion is values. There is no universal agreement on what a value is or on how to measure whether an individual holds a particular value. True to its ethnographic leanings, this project takes an emic approach to values, attempting to stay true to the understandings voiced by the ecovillage members. Individuals who participated in this project belong to two ecovillages whose members articulated and defined their core values and are trying to live by these values. For both communities, the value of ecological sustainability is what initially attracted many members. Ecovillage members from both communities also highlighted the values of diversity, trust, respect, equality, and responsibility as critical for creating and maintaining a sustainable lifestyle. Also, within both communities, there is a commonly held belief that decision making is influenced by whether members consider the core values during their decision-making processes.

Sites of Inquiry

The first ecovillage to participate in the study, Brook Ecovillage, is located on almost 8 acres of land within a suburban neighborhood in a picturesque city in the Pacific Northwest of the United States. At the time of the project, the community was engaged in the initial stages of development. Community members were defining policies, initiating the first building projects, and actively recruiting more members. A developing community was chosen because members were immersed in forming practices, including those needed to support information exchange within the community. This choice of a forming community was based on the premise that if adaptations were going to occur during the limited time of the project, then it was likely that they would occur during this formative period. I visited Brook more than 70 times for over 350 hours beginning with a few visits in 2005 and 2006 and extending into weekly visits in 2007 and 2008.

The second ecovillage to participate in the project, Springhope Ecovillage, was over 10 years old. This well-established community was chosen as a comparison point for the forming community. Located on almost 300 acres of land in a small, rural town in the Midwest United States, Springhope is far removed from the liberal West Coast, where plans for the community originated. The land surrounding the ecovillage meets all stereotypes of the contemporary American prairie, including rolling hills covered in soybeans, corn, and cattle.

Although the established ecovillage was still recruiting members when I visited, the cultural ethos and physical infrastructure of the village was considered formed. I camped on the property of Springhope for two weeks during the fall of 2008.

Innovative Adaptation

As mentioned earlier, before embarking on this project I visited a handful of sustainability-oriented intentional communities and was surprised by the high level of innovation in evidence as members adapted work tools and their own behaviors to better support community values. When I began the project in earnest, I did not find a similar level of explicit innovation (that is, adaptations different from mainstream practices) with information tools that I observed with noninformation tools.

During my time at Brook and Springhope ecovillages, I observed a broad range of information tools being used on a daily basis. Ecovillagers are heavily reliant on telephones, signs, paper-based bulletin boards, laptops, email, and other applications available through the Internet. Tensions between community values and community members' use of information tools soon became evident. During business meetings, casual conversations, and formal interviews, village members would refer to their dissatisfaction with certain information tools (particularly

digital information tools) and the practices surrounding their use. The concerns included health (such as severe back strain attributed to prolonged computer use), relationships (such as email flaming), and environmental concerns (such as the high ecological costs of creating, running, and disposing of digital information tools). Yet these issues remained unresolved at both communities. Through analysis of the data, six factors were identified as contributing to tensions surrounding villagers' perceived inability to resolve their concerns—lack of sustainable models of use, acceptance of societal expectations, technical infrastructure requirements, negotiation of relationships through tools, material feature constraints, and desire to participate in “modern civilization.” These closely intertwined factors are explored in the following sections.

Electronic equipment has become a mainstay of Western daily life. It is an integral part of everything we do and own—the televisions in our homes, the global positioning systems in our cars, the cell phones and MP3 players in our ears, the smart phones and video games in our hands, and the computers in our laps and on our desks (United States Environmental Protection Agency, 2008, p.1).

Lack of Sustainable Models of Use: Pervasive but Hidden

Information Tools

Digital information tools are pervasive in the Brook and Springhope ecovillages.

Members rely heavily on their laptops, cellular phones, and smart phones to

access the Internet, email, and other services that in turn depend on a

resourceintensive

infrastructure consisting of modems, switches, fiber optic cable, and

massive server farms. These digital information tools are marketed as being sleek

and clean, but they have a range of detrimental environmental costs, from how

their core materials are extracted from mines to how they are disposed of (Blevins,

2007; Grossman, 2006; Tomlinson, 2010). Although ecovillagers are exposed to

multiple examples of how to use noninformation tools in a sustainable manner

when they build their homes, tend their gardens, cook their meals, or travel to

work, there is little information in ecovillage material that guides use of modern

information tools. In June 2009, for example, Springhope's extensive Web site

was filled with dozens of beautiful images of villagers at work and play, engaged

in activities that match the community value of sustainability. Members are

shown gardening using raised beds, planting trees with hand tools, hand sowing

wild grass seeds, building structures from earthen materials, erecting solar panels,

and hand harvesting fresh produce. This visual framing of ecovillage life evokes a

back-to-nature lifestyle, with numerous models of how to use various tools in

sustainable ways. It does not show any digital information tools, even though there were more than 35 laptops and numerous cell phones and smart phones on the property. Although observations, interviews, and self-reports on surveys suggest that members of Springhope spend a substantial amount of every day using digital information tools, these interactions are not shown in the visual portrayal of how to use tools sustainably on Springhope's Web site. Their absence is startling.

Acceptance of Societal Expectations

Comparing how villagers negotiate mainstream societal expectations regarding use of noninformation tools with how society expects information tools to be used highlights another tension. Consider Brook Ecovillage's ongoing, multiyear negotiations with its city's zoning department. Brook members have ambitious plans to create a sustainable living showcase, an experimental hub for alternative tools and practices that support the community's value of sustainability. These innovative plans do not mesh well with their city's existing development practices and building codes. Composting toilets and solar-powered appliances (which do not require centralized sewage and electricity infrastructure) were difficult ideas to bring to fruition legally. The community negotiated for years with the city's zoning department to develop legal, sustainable building alternatives and to shift

local zoning expectations. The decision to try to change accepted patterns of behavior, including the use of noninformation tools, was a deliberate and strategic choice. The villagers wished to live up to their goal of being a demonstration site for ecological living in the 21st century. They wanted to be in a position to tell visitors, “If we can do this within city limits, so can you.”

In contrast, the founding members of Springhope Ecovillage chose to build in a rural area where building codes and development requirements were looser and rarely enforced. Members built cob and straw bale homes with the help of willing (but not necessarily licensed or even skilled) friends and without power lines or permits. These low-impact structures were often built, powered, and heated by alternative tools that were viewed as supporting the community’s value of ecological sustainability. Village members worked outside of the legal and technical infrastructures to avoid conflict with broader societal expectations of how their development should proceed.

I did not find evidence that the ecovillages took on similar challenges to societal expectations concerning the use of information tools, particularly digital information tools. In part, this may be because members do not know how to change or work around the established digital information tool practices. As one example, the governing infrastructure created for both villages included policies that set an expectation that members would maintain email accounts and check

them regularly. Members could not participate in governance and decision making within community life without regular access to email. Members noted that this expectation led to the need for each individual to own (or have daily use of) a computing device that accessed email or to be disenfranchised from the decision-making process.

Julia (Springhope): Which means that in order to be a part of this ecovillage, you have to pay to use a piece of technology.

That did not feel very good to me, maybe to others, I do not know. For some people, it was ideological. I do not want to have technology in my life. I want to live simply. I do not want to have all of these things. And all of this stuff.

Although members of both villages expressed a great deal of dissatisfaction with the larger societal expectation that people check email daily (if not hourly), they reinforced it through requiring regular email use. There was no evidence of efforts to shift this expectation, even though members discussed that it did not support many of their explicitly stated values.

Technical Infrastructure Requirements

While visiting both ecovillages, I saw repeatedly that the digital information tools that community members wanted to use had technical infrastructure requirements. These tools depend on an underlying system (such as electricity, network connectivity, servers, modems, wires, and switches) to function. These requirements often challenged the resource restrictions that members were trying to live by in other areas of their lives. For instance, one young man at Springhope chose to sleep year round in a hammock under a patchwork of blue tarps tied to a couple of trees. He slept outside through the bitter Midwestern winter because of his strong need to use as few resources as possible. However, during an interview, he explained that his work in software design required him to use a laptop, which in turn requires access to electricity, a modem, and all of the switches, hubs, conduit, and server farm infrastructure that are required to maintain the Internet. He was aware of the dissonance in this situation. Although he slept outside in a hammock in subzero Fahrenheit temperatures to avoid the resource drain that a more substantial shelter would entail, his laptop use demanded that he plug into an infrastructure that he identified as not supporting the values of his ecovillage.

Negotiation of Relationships through Tools: Local and

Global

Ecovillage community life is to a large extent about relationships—connections with other people and connections with the natural environment.² It is well recognized that our relationships with others are highly complex interactions, particularly when mediated by information tools.

Negotiating Local Relationships

During interviews and casual conversations, members of both ecovillages acknowledged that it is possible to live a lifestyle that strives to be sustainable without creating or moving to an ecovillage. Yet those who chose to live at Springhope or Brook were especially drawn to the idea of living in a community and building strong, local relationships with a core group of likeminded individuals. When gathered around a community dinner or during a discussion of banning cars in dense housing areas, villagers' conversations often led to the perceived lack of community connection in modern North American neighborhoods. According to a particularly reflective member of Springhope, he was attracted to community life because of a deep-rooted human need for connection:

Jordan (Springhope): By the time I moved here, I had already been an intern in another community and lived in another one and just recognized that I really wanted a sense of solidarity with other people and shared values. To really be living with other people. I don't want to live alone again in my life. Not because I love this ecovillage so much, though there are lots of things I really love about being here. It is rather I don't want to have all of my long-term relationships with people to be maintained through the phone or the Internet. I want my long-term relationships to be with people that I live with. That is one of the things that I actually think contributes hugely to my and other peoples' isolation and feelings of loneliness is living in a culture of transients—where through most of human history we evolved to live in tribes where you knew almost everybody almost your whole life. Everyone that you knew was—well, you knew them from birth or from when they were born, and you knew them until you died or they died. And the fact that kind of social unit has evaporated, from the planet practically, I think is a really a huge loss. . . . I think

this ecovillage is different enough, unique enough, that some subset of people here might stay for the rest of their lives.

Jordan suggests that having long-term relationships maintained by the phone or the Internet is dissatisfying for him. Although many digital information tools—applications such as social networking sites, text messaging, and Twitter—were designed to enable members of modern societies to build and maintain relationships, for many who choose to live at Brook or Springhope, there is something far more compelling about interacting face to face with their community neighbors. One young woman at Springhope, Deena, claimed that sometimes she refuses to respond to messages via email sent by other community members and instead she physically visits the person with whom she wants to interact.

Deena (Springhope): Sometimes I will check email, and someone will send something with a question, and I, on purpose, will not respond to it and will go find them that day or the next day to talk with them. Part of that is that I like being social and email is not social. I like face-to-face talk. Often I will go talk to someone and have a quick question or answer for

them, and I will find that I talk to them for an hour or an hour and a half. Because in person you can talk. . . . All these things will come up, and you will have a great conversation even though you didn't mean to.

Deena is in her early twenties and enjoys being “retro” (her term) with her means of communication. For Deena, avoiding the digital information tool in preference for a nondigital tool is viewed as a way to deepen relationships. A face-to-face interaction is even better. However, for all of her stated preferences for face-to-face or nondigital interactions with other human beings, Deena continued to use email and her cell phone, even when responding to messages from people who live less than 200 yards away. She claimed that face-to-face communications better support her values but that digital information tools are quicker to use. For both Deena and Jordan, digital interactions are perceived as requiring less relationship commitment to other individuals than nondigital interactions. Digital interactions are considered easier to disengage from, harder to sustain over the long term, and less likely to lead to deeper commitment. Yet members of both ecovillages continue to engage digitally on a daily, often hourly, basis.

Negotiating Global Relationships

Not all members came to ecovillage life because of a deep desire to live in community. Some were initially drawn to the ecovillage idea primarily because of a deep concern for humanity's influence on the environment and only later developed an appreciation for the importance of human relationships (particularly globally) as part of improving the environment. This sentiment was given voice by Conrad at Brook:

Conrad (Brook): I actually came into this project thinking more about environmental sustainability and having environmental components was initially my primary concern. But over the years of working on this project, I have become more aware of the role that social sustainability and equity and justice and all of those things are really a part, and we can't really preserve the planet if we cannot really preserve our social fabric.

Here Conrad is noting that higher levels of social equity and social justice are required before substantive changes can be made in how individuals interact with their environment. Using an extreme scenario, asking people who do not have

enough food to feed their families to be more ecofriendly because it is the right thing to do seems to be a misguided approach.

A different kind of relationship is implicated through the desire for and purchase of digital information tools. James H. Smith and Jeffrey W. Mantz (2006) contrast the ethereality of Western digitized life with the violent, destitute conditions of the regions where the Western world obtains the raw material for digital tools. They focus on the Democratic Republic of the Congo (DRC). The heat-resistant powder of tantalum is extracted from a silicate called columbitetantalite (coltan). As an extremely effective current conductor, tantalum is a crucial component of the microchips that are used in digital technology. Coltan mining in the DRC has been linked to fueling ongoing battles and human rights violations in the region (United Nations Panel of Experts, 2009). Smith and Mantz (2006) move back and forth between a utopian view of digital technology and horrific stories illustrating the wartorn reality of the DRC:

Once, when trying to leave the town of Bukavu with Mkapa to visit a nearby coltan mine, we were forced to turn around: two brothers and their wives had been buried in the ground up to their necks by soldiers when they refused the soldiers' demands of \$200 from each of them. The soldiers had then ransacked their houses and fields and were due to return while the living disembodied made up their minds; no one in the bus was willing to risk helping

these immobilized people, who, it was tempting to interpret, were apt icons of the underbelly of this age of fluidity, openness, and possibility. (p. 77)

Smith and Mantz take a strong position, suggesting that the Western appetite for inexpensive digital technologies feeds off the lifeblood of other humans, with the demand for the raw materials of digital goods fueling the dehumanization and genocide of the DRC.

These concerns for the people who suffer across the globe for the sake of a mediated existence were also expressed by members of the Brook and Springhope ecovillages. One summer afternoon, as Joseph was methodically turning pungent compost for Brook's extensive gardens, I asked him about scheduling an interview. He rested his pitchfork and asked what kind of things I wanted to talk about. When I replied that I wanted to talk with him about the tools he uses for communicating, without mentioning any type of tool (such as pen and paper or computers), he launched into a diatribe against the high costs of digital tools. I repeated his main points into a voice recorder on my drive home, and the following paragraph is taken from that recording:

Lisa: Mostly, he [Joseph] talked about social problems and how the greatest war of our time is being fought in West Africa over the elements that are needed for cellphones and the

like. Because the people that are fighting in these wars and the people being displaced by their homes in these wars—because our desire to get to these materials—are black people, and we don't care about them, and that is why this is continuing and why nobody knows about it and it doesn't make the news. These are people we feel so disconnected from.

Joseph was concerned that the Western appetite for digital information tools created a destructive relationship with people who lived halfway around the world. Yet a few minutes later in the conversation, he told me that he needed a new Apple® laptop because his current laptop was not powerful enough to run a music writing program that he really wanted to use. He shifted quickly from an ethical concern (many African people were harmed because the world desired more natural resources for digital gadgets) to a materialistic concern (he wanted a type of music software and therefore wanted a more powerful computer). At the time of the conversation, I was struck by what appeared to me to be the incongruity of Joseph's statements.

Months later, I observed a similar episode with Greta, also at Brook Ecovillage. Greta became animated while describing a recent episode with her best friend, a friend she described as totally infatuated with digital technology:

Greta (Brook): . . . she calls me from her cell phone in her car when she is driving someplace, saying—all excited about how she now has this ability to call someone and have their faces show up. She said, “I have this exciting new thing.”

And there were some pauses, and I was, like, “Ooh, I wonder what it is—like a baby or a ferret?” And she was, like, “This new technological advancement.” I was, like, “People are starving in the world. Who the fuck cares if you can see somebody’s picture on a phone?” It is not—it doesn’t fit with my values in terms of the energy and the time—and half of these things, half of what makes a cellphone work, comes out of some mine on the Ivory Coast or somewhere in Western Africa, which is basically causing the miners and people some real health problems.

And a lot of it is being exported by these big corporate powers because there are these minerals and these resources. So we get to have cellphones on the back of some poor black person. So I don’t need to live like that.

Now, I think it would be handy to have a cell phone if my car broke down in the desert.

Similar to challenges in negotiating local relationships, there appeared to be a dissonance between an ecovillage member's personal desire to engage with modern digital information tools and their perception that a Western appetite for digital information tools worsens global relationships—our relations as human beings with other human beings in distant locations.

Material Feature Constraints: Information Tools' End of Life

What happens to a tool when it is no longer needed for its designed purpose? Are there ways to deal with it that support ecovillage values? Unlike many noninformation tools (such as reappropriated bicycles or refrigerators), ecovillagers at Brook and Springhope had a difficult time figuring out ways to repurpose or reuse digital information tools when they were deemed no longer useful. In large part, this was due to the material feature constraints tied to the tool's functioning. Consider a printer, which is a complex device with highly specialized material features. It is difficult to conceptualize alternate uses for a printer other than creating a piece of modern art out of it or using it as an unwieldy door stop. The more complex and highly specialized a tool is, the more limited it is in supporting novel reuse.

Another option for a tool at the end of its lifespan is recycling. Members of both communities were aware that not all recycling efforts support community values. At community dinners and in other casual conversations, individuals noted that a significant percentage of recycling takes place overseas in communities that are desperate for income and therefore feel compelled to sacrifice tomorrow's health for today's employment, food, and housing. For example, a recent report from a province in southeast China describes typical conditions in a low-tech, recycling community where the work takes place in or near the family home. Circuit-board components litter the roads, and acrid fumes and odor from molten solder irritate the eyes and throat. Plastic recycling is carried out in the Longgang district of Guiyu. Plastics such as acrylonitrile-butadiene styrene, high-density polyethylene, and polyvinyl chloride are manually separated from e-waste, mechanically shredded into small fragments, immersed in large basins of water, and sorted according to differences in densities. The plastic fragments are then spread out on roads to dry and may be processed further by mechanical grinding to fine powder (Leung, Duzgoren-Aydin, Cheung, & Wong, 2008).

Leung et al.'s (2008) project collected air samples from inside family-run recycling workshops, schools, small restaurants, outdoor markets, hotels, and the campus of Shanou University. Study findings suggest that the recycling of printed circuit boards is a significant source of heavy-metal dust in the local environment.

The potential for adverse health effects is high for workers, their neighbors, and especially local children. Scientists (Wong et al., 2007; Fu et al., 2008) are concerned that heavy-metal exposure may be as much as seven times higher than the levels that were calculated for this study because of likely dust ingestion and the consumption of dust-laden food and water.

Anyone who wants to recycle an electronic information tool first needs to know where to find a company that will actually reuse or recycle the item. Confusion over where to find recycling services often leads people to leave the tool on a shelf or in a drawer. Springhope Ecovillage had a communal shelving unit filled with dusty, abandoned digital tools. Brook Ecovillage members showed me abandoned tools in their private residences. Conversations about recycling often had a circular pattern as people expressed their lack of knowledge about which items could be recycled, where they could go, and what actually happened (for example, in terms of effluent) during the recycling process.

What Cost “Modern Civilization”?

The quotations from Greta and Joseph earlier in this chapter stand out as particularly strong examples of people who experience value tensions but ignore them to participate in what they perceive as modern civilization. As stated by Drew during an interview:

Drew (Brook): I mean, we use email a lot. I think everyone who is doing anything organizing these days is relying heavily on email. Any organization that is trying to get anything done is using email. Some people probably function better with email than others. . . . But the organization is relying heavily on email for its communication—just the informational stuff.

Information tools, whether digital or not, and the manner in which they are used are viewed as part of the social world that humanity has created. We would not be the species we are today if we were not a technological, tool-wielding creature. A member of Brook expands on this sentiment:

Conrad (Brook): I think when I started this project that I was under what I consider an illusion that we could as humans on the planet—could actually live sustainably in a way that preserved the long-term fertility of the earth and the biodiversity and the environmental systems that support life on the planet, including human life. I think that was a big driver for me. In terms of, you know, if we could have a small ecovillage that demonstrated a small enough

ecological footprint, that perhaps if that were a model, then, you know, seven generations from now people would live the way we live and that might work.

... I had the rude awakening that although I had realized we had already overshot the world's resources, I didn't realize how far and how much. If you consider the pattern of carbon emissions and methane emissions that really began 8,000 years ago, when we had less than 10% of our current lifestyle and impact—and even at that time, we were already taxing the planet's ability to handle the carbon and methane from our agriculture. To think that we can get something for nothing or something for less. My current belief is that it is way too late for human civilization to sustain itself on this planet in any recognizable fashion past the end of this century. And so what I am doing is not really trying to save the planet or save civilization but trying to live in a way that seems as responsible, given that we know that we are consuming too much. And so that, for myself personally, has eased my guilt and eased my impatience and my judgment of other people—allowed me

to be more compassionate with myself and my fellow humans and realizing that we are all destroying the planet and there is no such thing as sustainable lifestyle other than hunter-gatherer level, small groups of people on this planet. Therefore, this is all the price that the planet, the universe, is paying for development of consciousness, music, the music of Beethoven. Because none of that would have evolved—sending people to the moon, our technologies. And the wonderful things that we do appreciate about human civilization would all have been totally impossible without sacrifice of basically the civilization itself and of the life-support system of that civilization.

Conrad raises the question of whether our current understanding of sustainability is possible to achieve, as human civilization uses increasingly technically sophisticated, infrastructure-dependent digital information tools.

Envisioning a Sustainable Future

Many histories of the human evolution weave our relationship to tools into their narrative (e.g., Dubos, 1965/1980; Mumford, 1961/1989). This relationship is

often framed as contributing to the continuous improvement of the human condition. Yet some fear that in our enthusiastic rush to design and use new tools, we are creating an environment that requires us to adapt our goals and values to better fit our tools. Bonnie A. Nardi and Vicki L. O'Day (1999) termed this phenomenon reverse adaptation. Concern over reverse adaptation has led many technologists to argue passionately that the human race needs to reconsider our tools and how we use them (e.g., Weizenbaum, 1976; Wiener, 1950).

Members of Brook and Springhope ecovillages define themselves, in part, by their active consideration of the tools they use and how they use them. As I learned in my research for this project, however, information tools stand apart from other tools that humans use. Digital information tools are problematic and resilient to local, values-based, creative adaptations. How do we address the apparent resiliency of information tools, particularly digital tools? The concluding paragraphs of this chapter provide examples of promising work that is being done by researchers to challenge this resiliency. The examples are framed as two distinct streams of inquiry, but the streams overlap at many points. The first stream represents those who craft design methods that support the design of sustainable information tools. The second stream represents those who are concerned with the development of creative, sustainable practices around the use of these tools. As discussed earlier, the term sustainability is not limited to efforts

to reduce the direct ecological effects of a certain tool or behavior. Spiritual, economic, and social considerations are critical for achieving a deep level of sustainability.

Design and Praxis

Designers are well positioned to address the challenge of rethinking unsustainable interactions: “As a starting point for a perspective of sustainability, design is defined as an act of choosing among or informing choices of future ways of being” (Blevis, 2007, p. 503). Scholars in this area investigate how to stimulate and support designers in considering the long-term implications of their work (e.g., Blevis, 2007; Nathan, Friedman, & Hendry, 2009; Tomlinson, 2010). For example, rather than considering how a design will perform for one person over the next six months or year, new design methodologies question the implications of a design over a decade or longer if thousands or millions of people around the world use it.

Recognizing that the effects of information systems, the ways that we use them, and the ways that they influence future ways of being in the world are intimately tied together (Blevis, 2007; Winograd & Flores, 1986), Batya Friedman and Lisa P. Nathan (2010) have conceptualized a research agenda that addresses multilifespan information-system design. One goal of this approach is

to craft design methods that support the creation of information systems that address societal problems, particularly those that might last for more than one generation (such as environmental degradation, pandemic viruses, and genocide). An example of what such a design method might look like is found in a set of 32 3" x 5" Envisioning Cards (2011) that help designers consider the long-term influences of their work (Nathan, Friedman, & Hendry, 2009). Each card in the set has a theme, such as "obsolescence," "adaptation," or "environmental sustainability." One side of the obsolescence card shows an evocative image related to this theme, and the other side includes text that discusses the theme of obsolescence and an activity that considers how the theme may relate to the team's design. The card activities have brought likely negative consequences of a design to the forefront of the design team's discussions, unlike previous design work, which focused primarily on desired positive consequences.

The Envisioning Cards provide a new approach to supporting the design of sustainable information systems, but additional tangible representations are needed. As suggested above, well-articulated arguments for changes in design practice exist (e.g., Blevis, 2007; Friedman & Nathan, 2010; Tomlinson, 2010). However, it is too early to claim that these new approaches will yield designs that support more sustainable interactions with and through our information systems.

Creative Information Praxis

Another stream of inquiry is developing and as yet has published no research findings or recommendations. David Levy, a computer scientist and philosopher, has been working to legitimize research in this area and has organized conferences and workshops to develop interest in and stimulate research projects that develop and support sustainable information practices. These gatherings include the 2004 Conference on Information, Silences, and Sanctuary; the 2006 workshop on Mindful Work and Technology; and the 2008 conference No Time to Think. Each gathering attracted academics, religious scholars, meditation experts, and other professionals who are engaged in information-tool work and who share a strong unease about their interactions with these technologies. I refer to the work in this research stream as creative information praxis. The implicit goal of creative information praxis research is to provide individuals with examples of and support for using information tools in ways that scaffold their own goals and values. Levy and his colleagues at the University of Washington are working on a research project that explores the influence of meditation practice on information tool use and productivity (Levy, personal communication, February 10, 2011).

Conclusion

This chapter describes an ethnographic project in which I investigated whether people who try to live by sustainability values adapt their use of information tools to reflect their values. Do they create a sustainability-oriented information ecology? To investigate this line of inquiry, one type of intentional community (an ecovillage) was selected as a site in which a values-based, sustainability-oriented information ecology would most likely be found. Over a period of two years, in two ecovillages in the United States, I documented community members' struggles to use information tools, particularly digital information tools, in ways that supported their values.

Before embarking on this project, I was inspired by Nardi and O'Day's claim that committed groups of individuals can change their information practices and policies to develop "appropriate uses of technology in light of our local practices, goals, and values" (1999, p. ix). My investigation into these two ecovillages provides empirical evidence that questions Nardi and O'Day's claim. The findings suggest that an explicit focus on values is not enough for a community of individuals to alter their information-tool use, particularly if they want to stay connected with society.

Behind each digital information tool are many complex phenomena. Cell phones, laptops, and other digital information tools require the mining of scarce

materials for internal components (such as coltan and gold), the development of highly specialized software, the maintenance of an energy-intensive infrastructure, and the development of shared sociocultural knowledge that allows the tools to be used in a manner that others understand. Due to their complexity, these tools are particularly resilient and resistant to local, value-based adaptations. I believe that the resiliency of digital information tools is a dangerous phenomenon. Producing and consuming ever faster and sleeker devices and incorporating these tools into more and more aspects of daily life are profoundly unsustainable.

As we continue to develop and use increasingly complex, infrastructure-dependent digital information tools, is social, economic, and ecological sustainability possible? The chapter describes two promising avenues for research—reenvisioning the way that we design information systems and developing creative information practices through which we interact with these systems. Behind both streams of inquiry is the hope that we can develop creative and sustainable interactions with and through our information tools.

For now, the questions themselves move us forward. Consider the words of Chris Jordan (2005), a photographer who explores the unsustainable Western lifestyle through haunting, evocative images:

I am in no position to finger wag; but I do know that when we contemplate a difficult question in the absence of an answer, our attention can turn inward, and in that space may exist the possibility of some evolution of thought or action. . . . It may not be the most comfortable terrain but I have heard it said that in risking self-awareness, at least we know that we are awake. (n.p.)

I am awake in this uncomfortable terrain, and I continue to look for answers.

Notes

1. To provide anonymity for the two ecovillages examined in this chapter, I used a random place-name generator ([www.http://plambeck.org/cgi-bin/placegen.cgi](http://plambeck.org/cgi-bin/placegen.cgi)) to generate the names Brook Ecovillage and Springhope Ecovillage. Providing complete anonymity to either ecovillage would require obfuscating the qualitative data presented as evidence, so the choice was made to include and not change the data.
2. Although ecovillage members recognize that humans are part of the natural environment, when they discussed the environment in general terms (such as “the

earth” and “Mother Earth”), they often mentioned humanity as a separate category.

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This book takes on that challenge and proposes a reenvisioned ecopsychology. Contributors consider such topics as the innate tendency for people to bond with local place; a meaningful nature language; the epidemiological evidence for the health benefits of nature interaction; the theory and practice of ecotherapy; Gaia theory; ecovillages; the neuroscience of perceiving natural beauty; and sacred geography. Taken together, the essays offer a vision for human flourishing and for a more grounded and realistic environmental psychology.Â Information Tools and Deeply Sustainable Living. 173. Chapter 7 Can Architecture Become Second Nature?Â Kahn and Hasbach are coeditors of *Ecopsychology: Science, Totems, and the Technological Species* (MIT Press, 2012). (2011). Chapter 1 (Biophilia) in *Technological nature: Adaptation and the future of human life*. Cambridge, MA: MIT Press. (pp. 11-25) Section 3 â€“
Rewilding the Modern Mind Many people who currently advocate for the importance of nature in human lives focus on what is close at hand: domestic, nearby, everyday nature. It might be a local park, oneâ€™s garden, oneâ€™s dog, a nearby walking trail, or birds finding sustenance in urban feeders.Â Living out of our minds. In P. H. Kahn, Jr. & P. H. Hasbach (Eds.), *The rediscovery of the wild* (pp. 119-138). Cambridge, MA: MIT Press. Foreman, D. (2013).Â In P. H. Kahn, Jr. & P. H. Hasbach (Eds.), *Ecopsychology: Science, totems, and the technological species* (pp. 1-21). Cambridge, MA: MIT Press. Sampson, S. D. (2012).