



Sustainability as an Organizing Principle for Higher Education

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Sustainability is a big idea, a very big idea. When taken at its full measure, it presents a challenge to individual and institutional cooperation that tests our imagination and culture on a scale unique in human history. Sustainability is a contested idea: a plural concept like democracy and justice that must be owned and made sense of by communities of diverse perspectives, conflicting values, and particular ecological and cultural settings. Sustainability is a practical idea that must be worked out on the ground, concretely and in synch with the rhythms of day-to-day life. Sustainability is a cosmopolitan idea; it is global, international, and intergenerational in outlook. Sustainability is fundamentally about education because it continually presents questions of value and practice by asking what is best and why, for the long run. The questions to which this book offers provisional answers is: How do we in higher education make our work fundamentally about sustainability? What kinds of questions do we need to ask and address? How does sustainability relate to our other core values and our mission? How does sustainability relate to the most pressing problems of our institutions and the broader society they serve? What can sustainability offer to scholars, practitioners, and students, some already pressed to do more with less, and others who have adequate resources but lack a broader creative culture that cultivates and rewards responsive interdisciplinary scholarship? And, what can scholars, practitioners and students offer to sustainability given their experience with big ideas, diverse perspectives, and the liberal arts?

In telling our story of the University of New Hampshire's journey to the future, we are introducing the "sustainable learning community" as an

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educational model for integrating sustainability into the fabric of an institution of higher learning to achieve the educational goal of cultivating a critical and creative global sustainability outlook. We begin by recognizing that our overarching effort is a variation on a much older and abiding cultural concern: clarifying what it means to be educated. Our approach to this concern weaves together ancient insights and modern necessities in a set of perspectives that we believe are responsive to the extraordinary challenges and opportunities of sustainability and that aim to empower and inspire students in all fields to advance sustainability in their civic and professional lives. The sustainable learning community model focuses on four key systems that underpin the ability of a community or society to define and pursue quality of life: biodiversity and ecosystems, climate and energy, food and society, and culture and sustainability. These are integrated as educational initiatives focused on institutional practices across what we refer to as the core functions of the university: curriculum, operations, research, and engagement (CORE). Together, the four systems and the CORE create the basis for building a global sustainability outlook by supporting educational innovations that cultivate perspectives that we have defined as “Earth system,” “citizen of the world,” “public health practitioner,” and “engaged intellectual.” The argument or experiment of the sustainable learning community is that by cultivating these perspectives in all students through a shared commitment to sustaining the foundations of a good quality of life for everyone, they will take a critical and creative global sustainability outlook into their civic and professional lives regardless of their area of specialization.

Many of these ideas are not new, though they are integrated with other ideas in what for some readers may be novel or unorthodox ways. The sustainable learning community draws heavily on the classical Western approach to liberal education, an education that “liberates the mind from the bondage of habit and custom, producing people who can function with sensitivity and alertness as citizens of the whole world.”¹ What is new is the world our students are inheriting. During the lifetime of today’s fifty-year-old, a wave of modernization and globalization has combined with startling demographic trends and technological developments to transform the earth system at an unprecedented rate.² Economically, extraordinary levels of wealth have been achieved but at extraordinarily high costs. Reflecting on the transition from the twentieth to the twenty-first century in 2000, then–United Nations Secretary General Kofi Annan observed that while there was much to be grateful for,

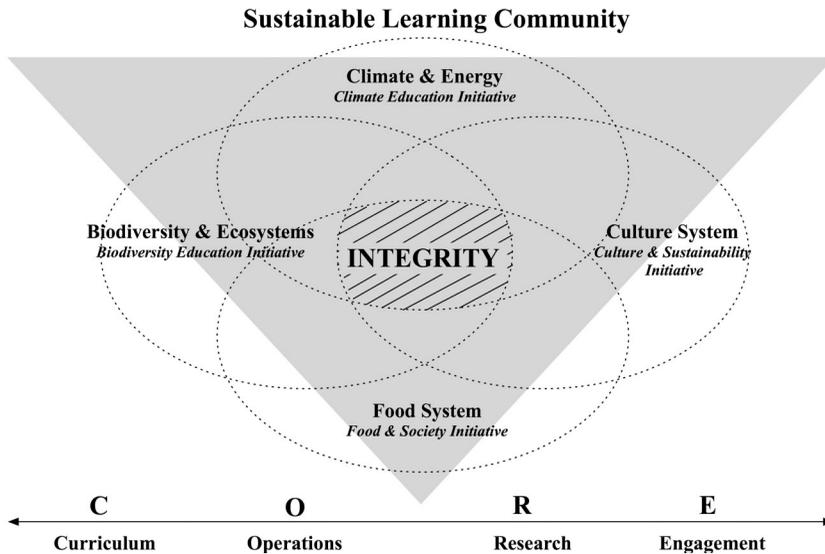


FIGURE 1.1. The four initiatives each are engaged in projects or interventions across the CORE functions of curriculum, operations, research, and engagement. All initiatives and CORE functions are overlapping and interactive. Sustainability entails sustaining the integrity of all four systems simultaneously. Together, the four initiatives and the CORE create the basis for building a global sustainability outlook by supporting education innovations that cultivate perspectives that we have defined as “earth system,” “citizen of the world,” “public health practitioner,” and “engaged intellectual.” Adapted from Tom Kelly, “Building a Sustainable Learning Community at the University of New Hampshire,” The Declaration 6.2 (November 2003), www.ulsf.org/pub_declaration_othvol62.htm

there are also many things to deplore, and to correct. The century just ended was disfigured, time and again, by ruthless conflict. Grinding poverty and striking inequality persist within and among countries even amidst unprecedented wealth. Diseases, old and new, threaten to undo painstaking progress. Nature’s life-sustaining services, on which our species depends for its survival, are being seriously disrupted and degraded by our own everyday activities.³

In terms of pressing societal problems, the next generation is inheriting a set of ecological and cultural challenges within our communities and across the globe that will shape the world of university students for generations to come, and against which we will continuously assess the responsiveness of our university community and the education it provides. As represented in figure 1.1, the sustainable learning community model is an interpretation of

the principles of sustainability articulated in agreements and declarations by the international scientific, political, and cultural communities beginning in the second half of the twentieth century. It is focused on sustaining the integrity of the four key systems within a learning community that teaches and learns through all of its actions.

In their current state, most universities and colleges could point to disparate academic programs, courses, research projects, and policies that relate directly and indirectly to the principles of sustainability. But as we will see, the key to sustainability is that it requires that all four systems (biodiversity, climate, culture, and food) be sustained *simultaneously* in order for overall integrity to be sustained; and that requires a different kind of scholarship that systematically focuses on *interactions* in a comprehensive and purposeful way.

For example, any approach to addressing carbon reduction and energy issues within the climate system, such as with biofuels, must be consistent with the integrity of the other systems if it is to be sustainable. In other words, to be sustainable, a biofuel must not only produce energy with a dramatic decrease in related greenhouse gas emissions — or even while functioning as an emissions sink — but must do so while not in any way undermining the integrity of ecosystems or the food and culture systems. The importance of attending to interactions is fundamental to sustainability and the cultivation of an outlook that focuses on those interactions is fundamental to the sustainable learning community. Accordingly, at UNH we are concerned with how best to draw out those interactions as part of a common experience for all students. The global sustainability outlook we seek to cultivate is not understood as a specialized outlook associated only with certain disciplines or professions, but rather is a shared outlook that forms the foundation of critical thinking, interpretation, and creativity across all disciplines; that shared outlook is rooted in the set of perspectives referenced above.

Our effort to build a common conception of sustainability is taking place within a university community that is being shaped continually by the large and impersonal forces of demography, culture, technology, political economy, and ecology; but our community is also being shaped by the immediate, personal forces of its own choices and the countless individual and collective decisions that are being made on a daily basis. These individual and collective decisions add up to an expression of identity and core values, an articulation of how we see and understand ourselves and our place in the world. As that identity and its values are internalized and upheld or overturned by successive generations of students, faculty, administrators, and staff, a learning

community results, whether by intention and design or not; and that learning community constitutes a powerful educational force that teaches, whether by intention and design or not. This is where a common conception of sustainability comes in. As faculty, staff, and students, we inherit an institutional identity that we collectively interpret and either sustain or overturn for what we think is better. The sustainable learning community, then, is presented as an educational reform project, an intentional effort to assess critically the complex web of relations that constitute our learning community and, where our interpretation of sustainability leads us to alter those relations, in and across our curriculum, operations, research, and engagement (the CORE), to do so.

Building the sustainable learning community begins by reformulating the question “what is sustainability” to “what sustains us?” This reformulation neutralizes, at least temporarily, the problem of sustainability as a term of jargon that often elicits a narrowly focused response about the environment or an inert, memorized phrase or fragment approximating the triad of economy, ecology, and equity or a variation on the definition from *Our Common Future*.⁴ When asked what sustains human communities, responses encompass everything from the basic necessities of air, water, food, and shelter to beauty and love as well as livelihoods, education, religion, and healthcare. The question elicits a genuine sense of the breadth and inclusiveness of sustainability without reference to any particular report or international agreement. This intuitive or common-sense grasp of sustainability is fundamental to building a common purpose because common sense reflects common values that provide a foundation for dialogue, critical reflection, and collaboration. It also aligns with the idea of “quality of life” as a rich, complex tapestry that shapes “what people are able to do and to be,” a profound concept that goes far beyond a country’s gross national product or measurements of individual economic utility.⁵

The sustainable learning community is built upon the principle of integrity. Integrity must be sustained within and across the four systems in order for the integrity of the community and quality of life to be ensured. Integrity here is defined from its Latin root *integritas*, which described an unimpaired condition, soundness, and health as well as uprightness.⁶ Accordingly, the health, wholeness, and soundness of each of the four systems need to be sustained, for it is the long-term integrity of the climate, biodiversity, food, and culture systems that sustains human communities now and in the future. Put directly, then, in a world of interconnectedness and interdependence, where integrity entails patterns of interaction among many different processes across

the blurred boundary of culture and nature, the job of sustainability is to nurture and restore the integrity of key systems that sustain the community of life and quality of life. As a critical and creative outlook, sustainability requires an adequate understanding of these systems and their interactions and highlights the need to weave together the arts, sciences, and humanities that only together can provide the range of perspectives and outlook that we are trying to cultivate in all students.

The collection of case studies that are presented in the subsequent chapters involve faculty, staff, students, and administrators working across the CORE in an increasingly coordinated fashion. Their stories are practical, concrete, and in synch with the rhythms of day-to-day life on and beyond the campus, but in the end they are all about the big idea of sustainability; about a critical and creative global sustainability outlook taking root within all of our students; about a community of learning in which this plural, contested, cosmopolitan idea is continually being worked out in practical terms on the ground, and thereby in the consciousness of all members of the community.

The fundamental place of community in sustainability cannot be overstated. Collective reflection on the overarching impact of all these efforts is a vital part of the sustainable learning community and a formative experience in the give and take of community life. Not only is the community the focus of what is to be sustained, it is also the basis for the ongoing *process* of sustainability. As noted above, sustainability is a contested, plural idea that has to be worked out continuously by communities of diverse perspectives, conflicting values, and particular ecological and cultural settings.

At the same time, sustainability is a universal idea that can be recognized *across* the diverse community settings where it is lived, a transcultural point of reference that can provide a basis for criticizing and reforming localized interpretations.⁷ It is far too easy, and in fact likely, to lose sight of the big idea of sustainability in the many details of the CORE. But to lose that big idea is to undermine the sustainable learning community and the critical dialogue between the detailed particulars of one community and the general principles of sustainability for all human communities.

The remainder of this chapter will provide background for connecting the big idea with its practical applications. It begins with the contemporary origins of the concepts of sustainability and sustainable development in the collective aspirations and “great values” of the post–World War II era; the resulting institutions, principles, and norms of modernization form the most immediate and familiar layer of our cultural inheritance and the setting in which the transition to sustainability takes place. A common understanding

of the origins and evolution of this very big idea serves the sustainable learning community by providing grounding for dialogue, argument, and persuasion to develop a shared interpretation of sustainability and its implications for the CORE. Following the review of this background, we briefly review salient trends and projections within and across the four key systems and the significance of the four educational perspectives that underpin the critical and creative global sustainable outlook that the sustainable learning community works to cultivate in all learners.

Defining Sustainability

In a contemporary sense, the principles, practices, and science of sustainability originate in the concept of sustainable development. “Sustainable development” is a term often used interchangeably with “sustainability.” Sustainable development grew from a series of international agreements on actions to advance the health and well-being of the world’s diverse communities in the face of unprecedented threats. These agreements emerged from debate and discussion within the international scientific community as well as through international political frameworks under the auspices of the United Nations and in manifold consultations in civil society. This is not to say that these principles, or more precisely the motives or intentions behind them, are not contested. On the contrary, plenty of contention surrounds sustainable development, particularly with regard to the authenticity of commitment to its stated principles by nations and organized interests, but also with its basic conception of “development” and the political, economic, and cultural assumptions upon which it is built; and as we will see, the questions of what is to be sustained by whom, for whom, and how it is undertaken are, and must be, the continual focus of sustainability initiatives.⁸

The international principles of sustainable development are articulated in reports such as *Our Common Future*, Agenda 21, and related documents resulting from decades of international discussion in the post–World War II period.⁹ The resulting documents underscore the all-encompassing breadth of sustainable development and the depth of transformation, collaboration, and coordination required to incorporate its values and principles into the world’s diverse cultures and institutions.¹⁰ A concise summary by Kates, Parris, and Leiserowitz points to the creative ambiguity of what they conclude is the most widely accepted definition of sustainable development: “Humanity has the ability to make development sustainable — to ensure that

it meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹¹ This definition, which is from the Brundtland Commission, they argue, provides the “malleability to allow programs of environment or development; places from local to global; and institutions of government, civil society, business and industry to each project their interests, hopes, and aspirations onto the banner of sustainable development.” That is both the good news and the bad. Sustainability cannot mean all things to all people; and the malleability of this definition enables calls for both radical and incremental change or continuation of the status quo to claim it as their cause, and advance what can be mutually exclusive approaches to defining and pursuing a quality of life.¹² As noted earlier, development is a highly contested concept and indeed one framing of the issue is that resolution of this conflict requires a search not for developmental alternatives but for alternatives to “development,” such as making quality of life the goal of international politics.¹³

Identifying the antecedents of sustainability in the common concerns and aspirations for peace, freedom, development, and the environment expressed in the international dialogue of the post-World War II period, Kates and his colleagues trace these core themes to the World Commission on Environment and Development (WCED) that was formed in 1982 and issued its report, *Our Common Future*, in 1987. Throughout the forty-year period leading up to the WCED, a series of international commissions and conferences endeavored to “link together the aspirations of human kind — demonstrating how the pursuit of one great value [peace] required [the simultaneous pursuit of] the others [freedom, development and environment].”¹⁴ This interdependence of great values is a critical and basic principle of sustainability and accounts for its consistent emphasis on the need to coordinate the interactions of culture and nature in very diverse settings. However, the emergence of sustainable development was also a response to a series of struggles by nongovernmental organizations and peasant and indigenous groups against an international development system that was driving a growing gulf between rich and poor countries, and between populations within countries, as well as environmental degradation and competition over natural resources. In the midst of these struggles, the United Nations called for a conceptual and political re-examination of development.¹⁵

While the general principles of sustainable development were refined and endorsed at the 1992 Earth Summit in Rio de Janeiro and reinforced ten years later at the 2002 World Summit on Sustainable Development, held in Johannesburg, South Africa, the inconsistency between principles and rhet-

oric on the one hand, and the worsening facts on the ground on the other, were inescapable; over the ten-year period from 1992 to 2002, conditions for the majority of the world's poor worsened along with local, regional, and global ecological systems.¹⁶ At the same time, the underlying assumptions and objectives of sustainable development as conceived by the wealthiest and most powerful nations were criticized for an unceasing advance of free trade and privatization in the name of continual economic growth as the only means to development. The United States and other Western nations were seen to be exercising their hegemony within the international order to impose a libertarian free-trade agenda through bilateral and multilateral mechanisms such as the General Agreement on Tariffs and Trade (GATT), the World Trade Organization, the International Monetary Fund, and the World Bank at the expense of social justice and ecological and cultural integrity.¹⁷ The continued wave of privatization and globalization, many developing countries argued, was resulting in the disempowerment of millions of the world's citizens through a shift in power from "national and local political agendas to global centers of economic power," and all in the name of sustainable development.¹⁸

This sense of a shift away from national and local control raised serious political and cultural questions about the goals of "development" and the international political processes devised to pursue it. Throughout the 1980s and 1990s, "culture" began to emerge as a critically important consideration in development and within the movement to rethink development. The United National Education, Scientific and Cultural Organization's (UNESCO) World Decade for Cultural Development was initiated in 1988 in response to the "dual need for a radical review of conceptions of development and for a reshaping of practices" that had made the 1980s what many experts characterized as a "lost decade" for development.¹⁹ One of the principle undertakings of the Decade initiative was the work of the World Commission on Culture and Development. The introduction by the Commission's president, Javier Perez de Cuellar, to its 1995 report *Our Creative Diversity* articulated concerns over what had become the orthodox and institutionalized values of development:

When our Commission began its work [in 1992], it had long been clear that development was a far more complex undertaking than had been originally thought. It could no longer be seen as a single, uniform, linear path, for this would inevitably eliminate cultural diversity and experimentation, and dangerously limit humankind's creative capacities in the face of a treasured past and an unpredictable

future. This evolution in thinking was largely the result of global political emancipation, as nationhood had led to a keen awareness of each people's own way of life as a value, as a right, as a responsibility and as an opportunity. It had led each people to challenge the frame of reference in which the West's system of values alone, generated rules assumed to be universal and to demand the right to forge different versions of modernization. It had led peoples to assert the value of their own cultural wealth, of their manifold assets that could not be reduced to measurement in dollars and cents, while simultaneously to seek the universal values of a global ethics.²⁰

In considering the role of culture in individual and collective well-being, the commission drew directly from the experience of integrating environment and development and declared that "the time had come to do for culture and development what had been achieved for environment and development" by the 1987 Brundtland report. The commission focused on policy recommendations as part of a broad call to action rooted in the recognition that economic and political rights could not be realized separately from social and cultural rights any more than peace could be pursued independent of consolidating democratic values: These were all "indivisible goals." It was time, they said, "to move culture to the center stage of development."

Recognizing the central role of culture in development draws the International Covenant on Economic, Social and Cultural Rights and the closely related International Covenant on Civil and Political Rights into sustainability. Together, these two international covenants articulate a set of commitments in support of universal human rights that provide a basis for defining the integrity of the cultural system, and that are ultimately inseparable from climate, biodiversity, food systems, and quality of life.²¹ This is extremely important for grasping the cosmopolitan nature of sustainability and it has very concrete and practical implications on the ground for universities. As was noted earlier, questions of development were central to the post-World War II international order, including the establishment of the United Nations; and human rights, understood as encompassing economic, civil, cultural, political, and social rights were being discussed, debated, and negotiated along with the charters for the World Bank, International Monetary Fund, and GATT.²² In other words, the international financial institutions through which the free trade, economic growth, and globalization approach to development has been conducted, were part of the same post-World War II order that gave rise to universal human rights, including cultural rights, that challenge the growth and consumption definition of development in favor of diverse perspectives

on modernization and quality of life. So, the plural and contested nature of development, and therefore sustainable development and ultimately sustainability, literally was built into the international order through treaties, declarations, and institutions that have helped shape the post–World War II era.

Two final international articulations need to be mentioned to bring this very brief history of sustainability to the present: First, the Millennium Development Goals (MDGs) were adopted in September 2000 to reaffirm the collective faith in the United Nations and its charter as “indispensable foundations of a more peaceful, prosperous and just world.” The MDGs present a series of quantifiable goals based on the same interdependent set of values of earlier agreements including freedom, equality, solidarity, tolerance, respect for nature, and shared responsibility.²³ A set of specific goals in areas such as poverty reduction were adopted to make concrete progress on social and environmental factors of development by 2015. The other articulation of sustainable development is the Earth Charter, an international, grassroots effort to develop “a declaration of fundamental principles for building a just, sustainable and peaceful global society in the 21st century.”²⁴ The Earth Charter initially was undertaken in preparation for the 1992 Earth Summit as a response to the Brundtland Commission’s call for a new charter setting new norms to guide the transition to sustainable development. While agreement among governments could not be reached on the charter at the Earth Summit, its advocates felt that it had received very strong support from international nongovernmental groups. In 1994, it was relaunched as a civil society initiative that now provides a well-grounded and widely endorsed approach to sustainability based on a survey and analysis of ethical principles embodied in more than fifty international legal documents and a six-year participatory review process involving thousands of written comments from around the world.

The significance of the Earth Charter lies, at least partly, in its alternative interpretation of sustainable development. Based upon articulated international ethical principles and broad input from international civil society, it calls for a concept of development that is about “being more, not having more” once basic needs have been met. We will look at this in more detail in our review of the cultural system, but for now, the key point is that the Earth Charter brings the plural nature of sustainability to its ethical foundations and focuses on quality of life — being more, not necessarily consuming more — as the goal of sustainable development. Understanding quality of life as a *culturally determined* collective goal rather than a single, uniform, linear path measured by economic growth means that sustainability arrives at our institutions of higher education as a work in progress with its plural, contested nature intact; and

because culture is the only means we have to interpret sustainability and work it out on the ground, it is extremely important that it be incorporated explicitly into a shared concept of sustainability.²⁵ Cultural self-understanding is an integral part of the citizen of the world and engaged intellectual perspectives and a full appreciation of the cosmopolitan outlook of sustainability would be impossible without it. Without cultural self-understanding, it is impossible to understand cultural rights as a part of basic human rights, human development, and quality of life; without cultural self-understanding, the big idea of sustainability is inaccessible to interpretation and utterly lost. And without cultural self-understanding, the ultimate significance of the interactions of the climate, biodiversity, and food systems and their relationship to sustaining quality of life for everyone, long-term, is also lost.

As noted previously, current and future generations of our students are inheriting a complex set of ecological and cultural challenges against which we should assess the responsiveness of the education we provide and the kind of scholarship we undertake. Toward that end, the University of New Hampshire introduced a set of perspectives that we believe form the foundation of a critical and creative global sustainability outlook and that when combined with the skills and knowledge of particular disciplinary majors will empower and inspire all graduates to advance sustainability as citizens and as professionals. The trends and interactions of the climate, biodiversity, food, and culture systems that we now will review briefly provide a grounded basis for thinking critically about the kinds of awareness, knowledge, skills, and commitments we need to cultivate in our sustainable learning community and thereby in our students. We have stressed the plural and contested nature of sustainability and we also have said that it cannot mean all things to all people and still have meaning; we also have argued that sustainability requires the integrity of all four systems to be sustained simultaneously at all scales: This means that a very complex set of interdependencies constrain and enable the cultural choices that we make about quality of life as we interpret sustainability and the universal ethical principles it seeks to uphold.

The Four Key Systems and the UNH Education Initiatives

Biodiversity and Ecosystems

As noted at the outset, the rate and degree of transformation of the Earth system during the lifetime of today's fifty-year-old is unprecedented. Indeed,

that is precisely one of the principle findings of the Millennium Ecosystem Assessment (MA), a five-year study modeled on the Intergovernmental Panel on Climate Change, conducted under the auspices of the United Nations, and involving more than thirteen hundred scientists from 95 countries: “Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history.” The MA notes that these changes were the result of humanity’s approach to meeting “rapidly growing demands for food, fresh water, timber, fiber and fuel.” However, it also notes that the result of these rising demands and our collective approach to meeting them has resulted in large-scale, irreversible loss in the diversity of life on Earth. Moreover, our approach to meeting these rapidly growing demands for ecosystem services has resulted in striking inequalities in which many regions and populations have been harmed in the process. Those who have suffered most from this process are the poor and disenfranchised.²⁶ The MA presents us with an extraordinary set of facts and a profound choice: Either we reverse the degradation of ecosystems while meeting rapidly increasing demands for their services, or continued and accumulating loss of biodiversity could overwhelm incremental efforts to sustain ecosystem services and trigger large-scale irreversible change. For scholars and educators, this presents a critical question: What does it mean to be educated in a biosphere that is suffering ecological degradation at a rate that is unparalleled in human history at a time when demand for ecosystem services is growing rapidly? We asked the parallel question for the climate system, and indeed the MA also noted that the impacts of climate change could surpass agriculture and land use as the dominant driver of global biodiversity loss by the end of this century.²⁷

The significance of biodiversity is that it is a vital sign for the health of ecosystems. Human communities are absolutely dependent upon healthy functioning ecosystems for their basis of survival and cultural flourishing; if the integrity of those ecosystems is corrupted, and declining biodiversity tells us that it is, then we are undermining the source of what sustains present and future generations.²⁸ A summary of global trends in ecosystem degradation is dramatic and disturbing. Large-scale transformation of the surface of the planet is resulting in irreversible changes to the diversity of life on Earth. Globally, the number of species on the planet is declining, as are the population size and geographic range of the majority of species across a range of taxonomic groups, and regions are becoming more homogenous as globalization inadvertently spreads flora and fauna species.²⁹ The MA reports that human activities have “increased the species extinction rate by as much

as 1,000 times over background rates typical over the planet's history," with somewhere between 10 and 30 percent of mammal, bird, and amphibian species currently being threatened with extinction. Coral reefs have been reduced by 20 percent with another 20 percent degraded, and mangroves that buffer coastal communities from storm surges and rising sea levels as well as providing critical habitat for thousands of fish species have suffered losses of approximately 35 percent.³⁰ The amount of freshwater impounded behind dams has quadrupled since 1960 and water taken from rivers and lakes has doubled in the same time, with 70 percent of it going to agriculture. As will be discussed in greater detail in the subsequent section on the food system, industrial agriculture has also resulted in a doubling of nitrogen and tripling of phosphorus coursing through the biosphere. Human activities have been established as the principal driver of ecosystem degradation and the critical uncertainties largely are focused on the collective actions of humanity in the coming one to four decades. The MA assessment brings the challenge of mitigating ecosystem degradation to society and higher education.

Mitigation of ecosystem degradation must also share center stage with the challenges of ongoing impacts of that degradation at regional scales as well as the adaptive capacity and vulnerability of populations to the accumulating loss of ecosystem services. The MA describes a scale of ecosystem degradation and loss of their life-sustaining services that is affecting billions of people. For example, the following ecosystem services are in a continuing state of degradation: capture fisheries, water supplies, waste treatment and detoxification, water purification, natural hazard protection, and the regulation of air quality, erosion, and local climate. Both capture fisheries and freshwater supply are characterized as being degraded well beyond levels that can be sustained and as much as one-quarter of global freshwater use is being met through "engineered water transfers or overdraft of groundwater supplies, including for irrigation, because water use exceeds long-term, accessible supplies." A 2003 report by the United Nations Environment Program concluded that freshwater scarcity was affecting a billion people in 2003, and will affect 4 billion people by 2050. The report also concluded that, as of 2003, adequate sanitation facilities are lacking for 2.4 billion people, about 40 percent of humankind, and that half of all coastal regions, where 1 billion people live, have degraded through overdevelopment or pollution.³¹

Those who are the most vulnerable to continuing ecosystem degradation are the poor and disenfranchised. The MA cites the persistence of extreme poverty and the critical observation that ecosystem degradation will exacer-

bate poverty and widen inequities and disparities. In other words, the MA observed that ecosystem decline is having a disproportionate impact on the world's poorest people while acknowledging that it is also at times a principal factor causing poverty. Ecosystem degradation is taking the patterns of poverty and inequity that modern development models have helped create and is making them worse. The results include burdens of disease being borne by the poorest and most vulnerable: The MA notes that half the urban population in Africa, Asia, Latin America, and the Caribbean suffers from one or more diseases associated with inadequate water and sanitation and more than approximately 1.7 million people — more than the entire population of the state of New Hampshire and Vermont combined — die each year as a result of inadequate water, sanitation, and hygiene. That the crisis of biodiversity is largely the result of altering ecosystems to produce food and fiber for human benefit is without question; notwithstanding the astonishing levels of production that have been achieved over a fifty-year period, “levels of poverty remain high, inequities are growing, and many people still do not have a sufficient supply of or access to ecosystems services.”³²

Biodiversity loss is a cumulative process in the biosphere. Educationally, the Earth system perspective makes clear that this is a global issue not simply because it is happening all over the globe, but because the drivers and the impacts are all connected: Continuing loss of biodiversity in the Amazon Basin affects all parts of the planet; we are all part of a single biosphere. When we consider sensitivity and adaptive capacity to biodiversity loss on a global scale, then poverty and vulnerability to the collapse of freshwater sources and fisheries, for example, take on gargantuan proportions affecting hundreds of millions of people. The public health practitioner perspective understands the vital importance of strengthening adaptive capacity to reduce vulnerability, the citizen of the world perspective cultivates solidarity and a shared sense of community with communities and cultures throughout the biosphere, and engaged intellectuals bring all of their capabilities to bear on this challenge. In order to frame the challenge that we face in the immediate and longer-term future, the MA developed four plausible future scenarios of human activities, including approaches to economic development, international relations, and governance.³³ The subsequent analysis found that, even under the most optimistic assumptions, the combined challenge of reversing ecosystem degradation while meeting increasing demands for ecosystem services could be only met partially; and even that outcome would entail “significant changes in policy, institutions and practices that are not currently underway.”³⁴ In other

words, partial success will require a reversing or redirecting of a suite of policies, institutions, and practices that are driving the problem.

Examples of near-term actions required to respond include “significant investments in environmentally sound technology, active adaptive management and proactive action to address environmental problems before their full consequences are experienced.” It also calls for “major investments in public goods (such as education and health), strong action to reduce socio-economic disparities and eliminate poverty, and expanded capacity of people to manage ecosystems adaptively.”³⁵ The political economy of making such changes will require all of the reason and persuasion that can be mustered, and then some. The stakes could not be higher: As the MA points out, continued degradation of ecosystems will exacerbate rather than address growing levels of poverty, hunger and food insecurity, child mortality, and disease.

More than a billion people lack access to improved water supplies and more than twice that lack access to improved sanitation. In 2004, approximately a billion people survived on less than \$1 per day of income and nearly 3 billion on less than \$2 per day.³⁶ And as noted by the World Bank, “poverty makes people vulnerable to economic shocks, natural disasters, violence, and crime. They are often denied access to education, adequate health services, and clean water and sanitation.”³⁷ This syndrome of poverty and ill-health is a major concern for public health; as succinctly stated by the World Health Organization, poverty breeds ill-health, and ill-health keeps poor people poor.³⁸ What the MA makes clear is that this syndrome includes ecosystem degradation, meaning that loss of ecosystem services breeds and exacerbates poverty, which breeds ill-health, and ill-health keeps people poor and can lead to further loss of ecosystem services. Clearly, the adaptive capacity of nearly half of the world’s population living in the grips of poverty is highly constrained, which means that they are the most vulnerable to ecosystem degradation. Pointing to patterns of “winners” and “losers” associated with ecosystem changes, the MA observes that it is the poor, women in poverty, and indigenous communities that have been harmed most by ecosystem changes and their lack of political and economic power combined with greater dependence on ecosystem services will result in their bearing the brunt of continued degradation.

So the challenge of mitigation of ecosystem degradation must be addressed in parallel with regional impacts and adaptation. As framed by the MA, the challenge of reversing ecosystem degradation on a global scale must be pursued while meeting increasing demand for those same ecosystem services.

The heightened vulnerability of almost half of the world's people to loss of ecosystem services, and those impacts combined with climate change, must be addressed if the integrity of the four systems are to be upheld simultaneously and sustainability is to be realized. The scale of the undertaking is vast and proportional to the unprecedented magnitude of the degradation of ecosystems. The implications for the citizen-professionals graduating from our institutions of higher education over the coming decades is inescapable: If they are to be responsive to this challenge, they will need the knowledge, awareness, skills, and commitment to affect an unprecedented level of institutional change domestically and internationally in order to reverse ecosystem degradation and reduce the vulnerability of those most affected by its impacts; the challenge very likely could grow more urgent and complex. The MA notes that the long-term sustainability of actions to mitigate ecosystem degradation are uncertain due to the potential of continuing loss of biodiversity to cause irreversible loss of ecosystem services. The MA states that there is "established but incomplete evidence that changes being made in ecosystems are increasing the likelihood of nonlinear changes in ecosystems including accelerating, abrupt and potentially irreversible changes." Such changes will have a broad range of direct and indirect impacts on human well-being.³⁹

The challenge of mitigation and adaptation to declining biodiversity and ecosystem services presents an immediate need for responsive curriculum, operations, research, and engagement on college and university campuses. How do we prepare the next generation of graduates to confront this challenge with critical and creative thinking and a commitment to action? How can we connect the Earth system, public health practitioner, citizen of the world, and engaged intellectual perspectives to empower and inspire graduates in all fields to advance ecosystem integrity? Here again, the sustainable learning community at UNH looks to continuity across the CORE. In the case of biodiversity, our large undergraduate course on global biological change (described in chapter 2) provides the Earth system perspective, while the Campus Master Plan described in chapter 3 provides a concrete example of ecosystem management in a mixed-use landscape. The plan includes a forest ecosystem reserve on the main campus with specific projects and management mechanisms that involve students, faculty, and staff, described in case studies in chapter 3 on the MUB Meadow and the Land Use Committee described. The Earth system and engaged intellectual perspectives come together in an innovative research initiative on the History of Marine and Animal Populations and the Stormwater Research Center

described in chapter 4 and the Lakes Lay Monitoring Program described in chapter 5.

In terms of biodiversity and ecosystem degradation, the challenge for our sustainable learning community is to cultivate the same Earth system perspective with particular emphasis on the biosphere and ecosystems and how human activities function within that system. This perspective combines a grasp of both the climate system and the biosphere as complex systems in and of themselves that are components of the larger Earth system. It also includes a clear understanding of the interdependence of human communities and ecosystems for sustaining mutual integrity, and the inescapable need to reverse ecosystem degradation on a global scale. We can symbolize this perspective by the Apollo 11 image of the Earth from space, the fragile, beautiful, and complex system that sustains our community of life. An international perspective is crucial here, because an unprecedented level of international cooperation is urgently required to reverse the degradation of ecosystems while meeting increasing demands for their services. When combined with the Earth system outlook, the cosmopolitan perspective cultivated in the citizen of the world engenders a respect and appreciation for the unity and diversity of nature and culture and their perpetual interactions that make our world. This “United Nations” outlook in turn supports the public health practitioner perspective that recognizes that divergent political, economic, social, and ecological conditions combine to render some populations, regions, and nations extremely vulnerable to ecological degradation. The resulting alertness to vulnerability can then awaken a sense of social justice and a call to action that is refined and put into action through the engaged intellectual perspective cultivated through experiences gained in our immediate community and region that nurture a cosmopolitan yet place-based orientation, or what has been referred to as a “rooted cosmopolitanism.” From this grounded experience, a grasp of complex systems is integrated with respect for cultural and ecological diversity and a commitment to public health and human rights that propel the inspired imagination, effective action and persuasive advocacy.

Climate and Energy

As of the writing of this book, the fourth assessment report (AR₄) of the Intergovernmental Panel on Climate Change (IPCC), a collective scientific undertaking spanning more than two decades and involving thousands of scientists from around the world, has presented us with an extraordinary set of facts that have given rise to a profound choice: Either we reduce green-

house gas emissions by at least 80 percent below 1990 levels by 2050, or we introduce “dangerous levels” of human-induced climate change.⁴⁰ As familiar as these numbers have become, scholars and practitioners must stop and fully grasp the enormity of this collective choice and its implications for higher education: What does it mean to be educated in a climate system that we now understand to be without precedent? The latest IPCC assessment observes that global atmospheric concentrations of carbon dioxide, methane, and nitrous oxide far exceed the natural range of concentrations over the last 650,000 years, and indeed some scientists suggest that carbon dioxide concentrations are without precedent in the last 25 million years.⁴¹ The AR4 also observes that the *rate of increase* of the climate impact, or radiative forcing of these rising concentrations, is unprecedented in the last ten thousand years and that the warming of last half-century is unusual in at least the previous thirteen hundred years.⁴²

The evidence of change surrounds us: From rising global average land and sea surface temperatures, accelerating warming trends, and the heating up of the global ocean to melting glaciers and rising sea level, the warming of the climate system is well underway, and the primary role of human activities in driving that change is beyond scientific dispute. As with biodiversity, the critical uncertainties that remain mostly have to do with what collective actions are taken or not taken by humanity over the next one to four decades: How will human societies respond to the climate crisis with respect to energy, land use, agriculture, and culture? Human responsiveness is the key variable and education, science, and philosophy are critical factors in shaping that responsiveness. As science continues to improve its understanding and predictive capability of regional impacts and adaptation, including the magnitude of warming in response to continued accumulation of greenhouse gases in the atmosphere, the focus finally has shifted from proving human-induced climate change to responding to it.⁴³ Another challenge of *mitigation* — reducing greenhouse gas emissions by at least 80 percent below 1990 levels by 2050 — joins the mitigation of ecosystem services at center stage in cultural responsiveness, including higher education: What kind of education and scholarship are called for?

As with biodiversity, the climate and energy challenges that we face include more than mitigation: The AR4 also analyzed the interactions of a changing climate with human and ecological systems and their adaptive capacity and vulnerability. The challenge of vulnerability is understood as a function of how sensitive a system or population is to climate change and the degree to which it can buffer its sensitivity through adaptation — whether it be levees

along the Mississippi River or access to air-conditioned spaces for large urban populations. Adaptive capacity is the key to managing vulnerability and it is a direct result of economic, cultural, and political factors. For example, in 1995, a heat wave in Chicago resulted in more than seven hundred deaths in one week; a disproportionate percentage of those were poor and African Americans who, along with other residents, “died alone, behind locked doors and sealed windows, out of contact with friends, family, and neighbors, unassisted by public agencies or community groups.”⁴⁴ The most vulnerable, those with the least capacity to adapt, suffered the greatest harm. Similarly, in August 2003, nearly fifteen thousand deaths were attributed to a heat wave in France, 60 percent of which were people aged 75 or older;⁴⁵ and in 2005, Hurricane Katrina played out in real time a scenario that emergency managers had planned for yet resulted in failures in emergency response at the local, state, and federal levels as well as in the social support systems for the poor, giving rise to a social catastrophe that overwhelmingly affected poor minority populations.⁴⁶

Questions of adaptive capacity and vulnerability apply globally as well as locally in settings such as Chicago and New Orleans. Climate change is a global phenomenon, so sustainability must address these questions on a global scale. In 2007, twelve out thirteen “flash appeals” — urgent requests by the United Nations for international financial and material aid for disasters — were weather-related. Flooding from Central and South America to Asia, where more than 60 million people were displaced, led the emergency relief coordinator of the United Nations to declare that a climate change “mega disaster” is upon us.⁴⁷ When we consider sensitivity and adaptive capacity to climate change on a global scale, then poverty and vulnerability to storms, floods, droughts, and heat waves take on gargantuan proportions where population growth, urbanization, and poverty combine with other factors to place hundreds of millions of people in highly vulnerable conditions. Educationally, an “earth system” perspective makes clear that climate change is a global issue; a “public health practitioner” perspective points to the importance of enhancing adaptive capacity to reduce vulnerability. The “citizen of the world” perspective cultivates solidarity with the multitudes of geographically remote vulnerable populations as well as with those in our own communities; and the “engaged intellectual” works as a citizen and as a professional to respond concretely to these challenges.

The *Stern Review*, a widely read and discussed economic analysis of climate change mitigation, impacts, and adaptation conducted by the British government in 2006, expressed the complexity of the challenge this way: Measures

to help people adapt to an already-changing climate are essential, and “the less mitigation we do now, the greater the difficulty of continuing to adapt in the future.” In other words, we have to address the impacts of an already-changing climate in the name of humanity and moral responsibility as evidenced by the United Nations’ “flash appeals” of 2007; but we must simultaneously reduce greenhouse gas emissions on a dramatic scale. The political economy of such an undertaking will require all of the reason and persuasion that can be garnered and then some. The *Stern Review* concluded that the “benefits of strong, early action [to shift to a low-carbon economy] considerably outweigh the costs”; but from a political point of view, it also noted the long lead times of such actions: “What we do now can have only a limited effect on the climate over the next 40 or 50 years. On the other hand what we do in the next 10 or 20 years can have a profound effect on the climate in the second half of this century and in the next.” But can we democratically conclude that we are responsible and have an obligation to act now for the benefit of future generations? Science has made clear that the risks of serious, irreversible impacts of climate change increase strongly as concentrations of greenhouse gases in the atmosphere rise, and the economic analysis of the *Stern Review* concluded that taking aggressive short-term action is economically rational. But will these arguments persuade us to make the changes that must be made?

The challenge of mitigation, reducing global levels of greenhouse gas emissions by at least 80 percent below 1990 levels by 2050, must be linked to regional impacts and adaptation if, as an international society, we are to sustain the integrity of the community of life and the basis of quality of life as sustainability requires. Accordingly, if the citizen-professionals graduating from our institutions of higher education over the next two decades are to be responsive to the crisis and opportunities of climate change, they will need the knowledge, awareness, and skills to affect an unprecedented level of institutional change to stabilize the climate system while reducing vulnerability to an already-changing climate. This is an enormous task. Indeed, it is proportional to the problem that our graduates are inheriting from us; and they will need every insight, inspiration, and vision that their culture has produced in order to meet that challenge. Moreover, as politically and culturally complex as that challenge is, it likely could become even more complex. The dynamics of the Earth system could lead to abrupt and irreversible changes of climate in the near-term on regional scales and the potential impacts could devastate the most vulnerable systems and populations along with the basis for international cooperation that mitigation and adaptation requires.

Under such conditions, would enlightened self-interest lead the United States and other wealthy nations to invest in the adaptive capacity of the most vulnerable nations? Could the desire to maintain order actually result in benefits for the most disenfranchised? Or would the wealthiest nations fortify their respective borders and consolidate control of resources to minimize their own vulnerability as “survival rather than religion, ideology, or national honor” drive political alliances?⁴⁸ If the recent past is prologue, then there is reason for deep concern: Climate change has already begun, as have the impacts of changing patterns of precipitation, wind, and extreme weather from warming; in addition, existing greenhouse gas concentrations already ensure that greater climate change and associated impacts in the coming years are unavoidable due to the long lifespan of carbon dioxide already in the atmosphere.⁴⁹ Impacts are already cascading across key systems and affecting basic needs, including freshwater, food, fiber and forest production, coastal settlements, and the integrity of estuarine ecosystems that contribute to fisheries and buffer flooding from tropical storms. The direct and indirect impacts on public health are projected to affect hundreds of millions of people through malnutrition, exposure to extreme events and water, vector and airborne disease, and pollution. Social institutions including industry and government will face economic impacts that could threaten their viability. Yet, in the face of these challenges, we are failing to respond proportionally, when we respond at all.⁵⁰

The AR4 notes that current levels of adaptation are inadequate to reduce vulnerability to future climate change; at the same time, emissions increases and therefore future concentrations of greenhouse gases are accelerating as “fast-growing economies invest in high-carbon infrastructure” and demand for energy and transportation grow.⁵¹ What is both hopeful and discouraging is that a significant amount of the knowledge, technology, and strategies for successful mitigation and adaptation already exist but are not being employed. The AR4 states that “formidable environmental, economic, informational, social, attitudinal and behavioral barriers” stand in the way of implementation. It is precisely these barriers that we and the graduates of our higher education institutions will have to overcome.

Higher education has some important questions to answer. How do we prepare the next generations of citizen-professionals to respond to these challenges in an effective manner? What knowledge, awareness, and skills are required to balance parochial and global interests and short-term desires and needs with long-term equity while mitigating and adapting to climate change? What educational experiences are capable of inspiring and empow-

ering the critical and creative problem-solver as scientist, legislator, entrepreneur, designer, clergy, parent, and citizen? From the perspective of sustainable learning community, the answers lie in a continuity of experience that purposefully links the classroom with the research lab or study site and the broader community; and this is where the case studies that follow come in. The co-generation power plant combined with the landfill methane gas line described in the Climate and Energy section of chapter 3, on campus operations, provides students with a concrete example of an energy policy and infrastructure that saves money, reduces greenhouse gases, and enhances energy security. When presented as part of a general education science course on Global Environmental Change, described in the same section in chapter 2, students studying the Earth system and sustainability analyze its impact on overall university community emissions, and build upon it to identify and recommend specific ways to aggressively reduce emissions further. Those student recommendations are then integrated into the policy deliberations of the Energy Task Force described in chapter 3, and in some cases forwarded as recommendations to the UNH president and cabinet. Stated simply, the sustainable learning community model assumes that the only way to ensure that we are preparing *responsive* citizen professional in all fields, is to ensure that we act as a *responsive community*, comprehensively and systemically, in our day-to-day lives as a university community.

With respect to the climate system, that means cultivating an Earth system perspective based upon a clear understanding of how climate and human activities function within that system, gaining a full appreciation, for example, of how human activities both affect and are affected by the climate and recognizing that there are worse and better ways to configure human societies to sustain the integrity of our interdependent climate and cultural systems. In responding to the challenge of climate change, the Earth system perspective is the best perspective that modern science can provide and is perhaps best symbolized by the Apollo 11 image of the Earth from space; an image that reminds us that we are all citizens of this Earth system. This perspective also reminds us that humanity, in our aggregate numbers and transformative activities, now affects the planetary system like a force of nature, leading scientists to refer to a new geological epoch, the Anthropocene Era, in which human activities are not only influencing but dominating the system.⁵²

But as vital as the Earth system perspective is, it is only one part of the educational challenge of climate change. The *Stern Review*, referred to above, takes what it calls “an international perspective.” Noting that “climate change is global in its causes and consequences, and that international collective

action will be critical in driving an effective, efficient and equitable response on the scale required,” it points to the absolute necessity for “deeper international cooperation.” This international perspective must compliment and be informed by the Earth system perspective while recognizing the profound complexity of the international cultural landscape. We refer to this as the “citizen of the world” perspective, one that nurtures a cosmopolitan rather than a parochial outlook and that cultivates a sense of solidarity with the rest of humanity, who, of course, are also citizens of the world. This perspective is part of our cultural inheritance from the philosophy of ancient Greece and will be discussed in greater detail in the final section of this chapter.⁵³ Given the urgent need for international cooperation, we could symbolize the citizen of the world perspective by the official emblem of the United Nations, a projection of the Earth framed in olive branches representing the interdependent great values of peace, freedom, and respect for nature and human rights.⁵⁴

The citizen of the world perspective not only needs to be informed by the Earth system perspective, but also by what we refer to as a “public health practitioner” perspective. This perspective recognizes the dynamics of the sensitivity, adaptive capacity, and vulnerability framework introduced earlier: While human populations share broad physiological sensitivities to climate variability and the cascading direct and indirect impacts it has for public health, factors such as poverty, social isolation, and political disenfranchisement reduce or effectively eliminate adaptive capacity and leave some populations much more vulnerable than others; this is the case whether they are in a city like Chicago or New Orleans in the United States, or in the rural areas of Uganda. A public health practitioner perspective also serves as a powerful bridge between the impacts of environmental degradation resulting from global change and violations of human rights. Recognition of how human rights affect health and vulnerability, how public health policies affect human rights, and how their synergistic interactions shape the ability of a community to sustain a desired quality of life form an important part of the global sustainability outlook that we are working to cultivate in our learning community and students in order to strengthen our responsiveness to climate change.⁵⁵

With the public health practitioner perspective, the Earth system and citizen of the world outlooks are integrated in the UNH curriculum within a framework that understands human health and integrity as emergent properties of a complex set of continual interactions operating from the local to the global scale and from the past and present out into the future. The public health practitioner perspective also bridges this complex systems and human

rights outlook to an action-oriented commitment that characterizes what we refer to as the “engaged intellectual” perspective. The engaged intellectual continuously looks to the application of knowledge, creativity, and insight to advance sustainability. The engaged intellectual also continually tests the soundness of conventions such as laws, theories, or practices and with the foundation of the other perspectives, attends to the interactions of culture and nature in a nuanced and alert way.

Food and Society

In the 2008 film documentary *Killer at Large*, the Surgeon General of the United States from 2002 to 2006, Dr. Richard Carmona, was asked what the most pressing issue was in America. He responded, “Obesity. Because obesity is a terror within. It is destroying our society from within and unless we do something about it, the magnitude of the dilemma will dwarf 9/11 or any other terrorist event that you can point out.”⁵⁶ Carmona’s predecessor, Dr. David Satcher, also had recognized this public health crisis and issued a call to action in 2001 that declared an epidemic of overweight and obesity and an appeal for preventive action.⁵⁷ Satcher was reacting to national trends that included a doubling of overweight children and a tripling of overweight adolescents in the previous twenty years. In an October 2000 letter to the editor in the *Journal of the American Medical Association*, the director of the Centers for Disease Control and Prevention, commenting on growing prevalence rates of obesity in the United States including a 60 percent increase in adult obesity rates since 1991, stated that “as a nation, we need to respond as vigorously to this epidemic as we do to an infectious disease epidemic.” In his *Call to Action*, Surgeon General Satcher pointed to the “tragic results” of the epidemic, including approximately 300,000 deaths a year associated with overweight and obesity. “Left unabated,” he observed, “overweight and obesity may soon cause as much preventable disease and death as cigarette smoking.”⁵⁸

But the need for action is not just in the United States. In 2002, the World Health Organization published the findings of one of its largest-ever research initiatives: *The World Health Report 2002 — Reducing Risks, Promoting Healthy Life*. The report was a collaborative effort of health experts from around the world and it focused on a select number of what they considered to be the most important risks to human health identified by the burden of disease they are associated with.⁵⁹ The goal of the analysis was to project the global

health benefits of *continuously reducing* these same risks over the next few decades. The analysis of the actual causes of major diseases produced a prioritized top-ten list of risk factors that could be targeted for reduction, and if successful, positively affect an extraordinary number of lives through reducing the burden of disease. This list of ten, which follows, accounted for more than one-third of all deaths worldwide: underweight; unsafe sex; high blood pressure; tobacco consumption; alcohol consumption; unsafe water, sanitation, and hygiene; iron deficiency; indoor smoke from solid fuels; high cholesterol; and obesity. As can be seen, literally half of this list — underweight, unsafe water, sanitation, and hygiene, iron deficiency, high cholesterol and obesity — are all directly connected to our food system; and of the remaining five risk factors, high blood pressure and indoor smoke are at the very least indirectly linked to the food system as well.⁶⁰

Under the heading of “enemies of health, allies of poverty,” the report notes how the risk-factor findings emphasize the alarming global gap between rich and poor and the degree to which global disease burden is the result of undernutrition among the poor and of overnutrition among those who are better-off, *wherever they live*. Some quantities illustrate what the report calls the “shocking” contrast: “At the same time that there are 170 million children in poor countries who are underweight — and over three million of them die each year as a result — there are more than one billion adults worldwide who are overweight and at least 300 million who are clinically obese. Among these, about half a million people in North America and Western Europe die from obesity-related diseases every year.” As striking as these contrast are, the report has even more troubling conclusions for the world’s most vulnerable: risk factors including high blood pressure, cholesterol, tobacco, alcohol, and obesity were previously understood as risks of affluence largely associated with so-called industrialized countries. But findings of the 2002 report demonstrated that these risks have increased in developing nations, thereby creating a “double burden” of risk as they combine with the continuing infectious diseases threats still endemic to much of the world’s populations to increase the overall risk among the poorest and most vulnerable populations in the world.

The report makes a profound observation about a globalizing culture of recklessness, stating that “in a number of ways, then, this report shows that the world is living dangerously — either because it has little choice, which is often the case among the poor, or because it is making the wrong choices in terms of its consumption and its activities.”⁶¹ This is a point that will be discussed in more detail under the next section on culture, but it is worth noting that the evidence of the report suggests that a kind of “risk transition” is tak-

ing place in which patterns of living associated with affluence, consumerism, and chronic rather than infectious disease are taking root in many parts of the world. Developing countries are experiencing marked increases in overweight and obesity among children, adolescents, and young adults and the same threefold increase in obesity that has taken place in the United States since 1980 also has occurred in Eastern Europe, the Middle East, the Pacific Islands, Australia, and China. So the challenge of nutritional health clearly comes to center stage of sustainability and the need for cultural responsiveness. But, as was the case with the climate system and ecosystems, mitigation of our collective nutritional health crisis presents multiple challenges. The WHO report points to a critical link to the larger food system, noting that “changes in food processing and production and in agricultural and trade policies have affected the daily diet of hundreds of millions of people.”⁶² Recognition of this same link to the larger food system had been articulated clearly in 1996 in the goals and plan of action resulting from the World Food Summit in Rome, as well as in the 2008 World Development Report by the World Bank and the 2008 International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD).⁶³

The World Bank’s focus on agriculture in its 2008 World Development Report, its first focus on agriculture in more than 25 years, could represent a genuine turn-around of how agriculture is viewed and prioritized by the international development community. Over the previous 25 years, agriculture became a low-priority economic activity for the international development field; under the dominant view of development that advanced a uniform path of modernization, agriculture was an activity that was supposed to recede in national importance as development progressed. The results of this were concrete and devastating for the world’s poorest countries: Development assistance for agriculture from foreign governments and international financial institutions decreased by 50 percent between 1980 and 2002; “a neglect” as one analysis observes, “that is all but incomprehensible given that three-quarters of the world’s population living below the \$2 per day poverty line live in rural areas, most of them directly or indirectly dependent on agriculture for their survival.”⁶⁴ This disinvestment in agriculture was also manifest in the budget of the FAO, the convening organization of the 1996 World Food Summit. The FAO’s program and operating budget fell by 31 percent and its total staffing by 25 percent between 1994 and 2005.⁶⁵ These cuts occurred at the same time that the FAO was charged by UN member nations with increasing the access of all people at all times to sufficient nutritionally adequate and safe food; achieving a 50 percent reduction of chronically undernourished

people by 2015; and achieving this goal by integrating sustainable agriculture and rural development while working to support sustainable utilization of natural resources including land, water, forest, fisheries, and genetic resources for food and agriculture.⁶⁶

Domestically, the link to agriculture and the larger food system is also well-recognized. The findings of a summit of food and nutrition experts on childhood obesity concluded that agricultural policies have a profound impact on the food system. Citing subsidy policies under the U.S. Farm Bill that have stimulated the overproduction of corn, they trace the impacts of those subsidies to decisions by the food industry to expand the use of cheap corn as live-stock feed and as a sweetener. The report cites USDA data showing that “over the last four decades, the real prices of energy-dense foods, such as meats, fats, oils and processed foods, have decreased, while the price of fresh fruit and vegetables has skyrocketed.” Consequently, energy-dense foods became more affordable than foods such as nutrient-dense fresh produce leading to the inescapable conclusion that “public health goals have not been considered in the design of agricultural policies.” A responsive food system, they argued, should ensure that available foods are healthy and that includes the “systems designed to produce and distribute them.” The results of a responsive system would benefit the “economic vitality and physical health of farmers, consumers and their communities.”⁶⁷

Not surprisingly, these same agricultural policies are directly affecting agriculture, which means farmers, soils, and communities across the country. The result has been a polarizing force that is wreaking havoc on U.S. farmers as well as farmers across the globe. An analysis by the University of Tennessee Agricultural Policy Analysis Center found that a shift in U.S. farm policy from market stabilization to what is referred to as “decoupled” programs and trade liberalization have had dramatic results particularly since 1996:

U.S. crop exports have remained flat or declined, farm income derived from the marketplace has fallen dramatically, government payments to farmers have skyrocketed, and consolidation and corporate integration of farm assets in ag sectors such as livestock have reached record levels. The consequences of the policy shift have been global, making American ag policy a lightning rod for governments and producers around the world. Since 1996, world prices for America’s four chief farm exports — corn, wheat, soybeans and cotton — have plunged more than 40 percent. In their wake, farmers from the U.S. to Peru, from Haiti to Burkina Faso have harvested poorer incomes, hunger, desperation and migration. Today, global agriculture faces a crisis.⁶⁸

The complex web of unrestricted production levels of highly subsidized commodity crops in the United States and other industrialized nations, combined with international finance and trade policies that demand that developing countries liberalize their agriculture markets, has created disastrous results for small-scale farmers in the developing world producing for domestic and often very local markets. A sustainability perspective focused on the food system highlights the fact that the U.S. Farm Bill, a multibillion-dollar legislative policymaking mechanism, “directly affects trade, subsidies, [export] dumping, food aid, market concentration and public health” globally.⁶⁹

In the United States, one of the results has been growth in the extremes of agricultural enterprises: Very small farms that sell directly to customers through farmers’ markets and other direct-marketing settings, often on a part-time basis, are flourishing, while mega-agribusinesses that have consolidated an unprecedented level of control over agriculture, processing, and marketing are growing significantly. This pattern of agricultural development has had a disastrous effect on independent family farmers that has led to what is being referred to as a “disappearing agriculture of the middle.”⁷⁰ The “middle” refers to the market place between very small-scale direct marketing, which includes many part-time farmers, and vertically integrated commodity markets that reach around the globe. The agriculture of the middle represents the farm enterprises that provide fulltime livelihoods for large family farms. These farms also manage the largest percentage of farm land in the country, which they steward in anticipation of their offspring continuing to farm for generations to come; they also play a key role in sustaining rural communities through their unique contributions to the economic, ecological, and cultural foundations that sustain those communities. As a result of a loss of the agriculture of the middle, farm diversity has decreased and vulnerability has increased across rural America.

So the challenge of advancing a sustainable food system requires responsiveness to the interdependence of agriculture, trade, rural development, and nutrition. It also requires that mitigation and adaptation to climate change be addressed while sustaining the integrity of the ecosystems that form the foundation of agriculture.⁷¹ As noted in the previous section on ecosystems, agriculture is the principle driver of habitat change, which itself is the most important direct driver of biodiversity loss globally. With cultivated systems now covering a quarter of the Earth’s land surface and projections of still greater conversions of grasslands and forestland to cultivation in the coming decades—along with associated nutrient runoff and water withdrawals for irrigation—the challenge of sustaining the integrity of food systems as

well as the ecosystems upon which we all depend has never been greater.⁷² While organic agriculture's capacity to meet the growing demand for food is debated, the policy and scholarly community have argued that an ecological approach to agriculture—including Integrated Pest Management and Conservation Agriculture, which pursues higher production rates with significantly lower inputs of chemical fertilizers and pesticides—is required for sound ecosystem management.⁷³

In fact, a 2007 study that compared productivity of conventional and organic and sustainable agricultural production systems found that “current scientific knowledge simply does not support the idea that a switch to organic and sustainable agriculture would drastically lower food production and lead to hunger.” On the contrary, the study concluded that “even under conservative estimates, organic agriculture could provide almost as much food on average at a global level as is currently produced,” and that under more “realistic” estimates organic agriculture could actually increase global food production.⁷⁴ The debate over production systems is part of a larger political struggle over who decides what development paths, including programs to reduce hunger and poverty, are to be taken. Within this larger debate, the concept of “food sovereignty” emerged in the 1990s as an “umbrella term for particular approaches to tackling the problems of hunger and malnutrition, as well as promoting rural development, environmental integrity and sustainable livelihoods.”⁷⁵ Developed by nongovernmental and civil society organizations including farmers, food sovereignty is being advanced as “a counter-proposal to the mainstream development paradigm built on liberalized international agricultural trade, trade-based food security, and industrial agriculture and food production by well-resourced producers that are seen as lacking respect for or that support the interests and needs of smallholder farmers, pastoralists and fisherfolk and the environment.”⁷⁶

So the challenge of mitigating under- and overnutrition, or hunger and obesity, must be linked to agriculture and trade if the international community is to achieve the goals of the World Food Summit, the Millennium Declaration, and sustainability. It also will have to incorporate agroecological approaches to farming, including organic and sustainable agriculture, across the diverse ecological, cultural, and political settings of the world's populations, and it will have to ensure that agriculture and trade policies do not undermine local and regional agricultural enterprises and food sovereignty. In addition, it will have to incorporate mitigation and adaptation to climate change and loss of ecosystem services. This broad and integrated approach was called for by the 2008 International Assessment of Agricultural Knowledge, Science and Tech-

nology for Development (IAASTD), an international assessment process initiated in 1992 by the World Bank, the Global Environmental Facility, and UN agencies. Based upon broad, international stakeholder consultations, the IAASTD issued findings and recommendations on how agricultural knowledge, science, and technology can best be developed and deployed to meet the need for “food and livelihood security under increasingly constrained environmental conditions from within and outside the realm of agriculture and globalized economic systems.”⁷⁷

As with climate change and biodiversity, the knowledge, awareness, and skills to reorient institutions across the food system in order to advance public health and food sovereignty on both a local and global scale, while sustaining the integrity of ecosystems and adapting to climate change and loss of ecosystem services, are to be found in a continuity of experience across the curriculum, operations, research, and engagement (CORE) functions of the university that models a sustainable food system. For example, the case study on the New Hampshire Center for a Food Secure Future described in chapter 4 provides a research and engagement complement to the dual major in EcoGastronomy described in chapter 2. Both are rooted in a food systems outlook that integrates sustainable agriculture, food entrepreneurship, and economics with nutrition and public health. When these scholarly efforts are presented as part of the annual Local Harvest dinner that also features produce from the student Organic Garden Club described in chapter 3 and a poster on the Organic Dairy Research Farm described in chapter 4, students, faculty, staff, and the broader community experience the integrated and systemic response of the sustainable learning community to the challenges and opportunities of the food and agriculture system. In other words, at UNH we are working to inspire and empower all graduates to advance sustainability in the food system by embodying the principles of a sustainable food community across the CORE.

The IAASTD concluded that “business as usual is not an option” and that to meet food-related development and sustainability goals, a “fundamental shift in agricultural knowledge, science, technology, policies, institutions, capacity development and investment” is required. To build a global sustainability outlook on the food system, the Earth system perspective provides an understanding of the ecological foundations of agricultural production systems and their direct and indirect interactions with climate and biodiversity; it also emphasizes the interdependence of energy, biogeochemical cycles, ecosystem services, resilience, and vulnerability. The Earth system perspective enables students to appreciate ecological interdependencies from a

continuum of vantage points encompassing the Apollo 11 image of the Earth to their own watershed and those that are a half a world away. The goals of the Plan of Action of the World Food Summit, the recommendations of the IAASTD, and the broader Millennium Development Goals clearly require the same unprecedented level of international cooperation called for by both the climate and biodiversity challenges and therefore require the nuanced international outlook of the citizen of the world perspective. This includes a grasp of the demographic patterns of burgeoning population growth and urbanization in the developing world, the significant impacts of international trade and finance as well as agricultural policies on food systems, and the growing demand for food sovereignty.

To respond effectively to the dramatic disparities of wealth and resources across the food system, graduates will be well-served by the public health practitioner perspective presented in both previous sections that sees the inextricable links between public health and human rights and the need to manage vulnerabilities through a range of approaches, including the strengthening of resilience of local and regional food systems. The ability for vibrant local and regional food systems to enhance adaptive capacity and reduce food system vulnerability in disparate settings throughout the world draws the engaged intellectual perspective into action. When combined with the Earth system, public health practitioner, and citizen of the world perspectives, the engaged intellectual is alert to the diverse ecological and cultural settings in which agroecology, food entrepreneurship and cuisine, and nutritional health interact; and that alertness begins right in our campus communities that present concrete food systems where these same general interactions are at work. Applying knowledge, values, and skills to ensure that our campus community food systems reflect the same “rooted cosmopolitanism” referred to in the ecosystem discussion calls on students and all members of the university community to draw together meaningfully the Earth system and agroecosystem perspectives with a cultural awareness of place and taste as well as a commitment to public health, human rights, and sustainability all sustained through imaginative, effective action.

Culture and Sustainability

Within the lifetime of today’s fifty-year-old, an unprecedented degree of cultural transformation has taken place across the world. Developments in technology, industry and business, demographics, media, religion, government, education, and the family have interacted in manifold ways that have reshaped

these basic institutions to such a degree that they now form the foundation of wholly new culture that did not exist fifty years ago; the “global consumer culture.”⁷⁸ While the consumer culture has deep and varied roots in Western civilization and the late nineteenth and early twentieth century in the United States, the phrase “global consumer culture” is being used here to refer to the unique conditions that have emerged since the end of World War II. Since 1950, world trade has grown twenty-seven fold in volume and world output has grown by nine fold.⁷⁹ During this same period, the so-called Asian Tigers of Hong Kong, Singapore, South Korea, and Taiwan and since around 1980 China, were transformed from one of the world’s poorest regions to a center of global economic manufacturing, urbanization, and economic growth. One result of that growth has been an explosion of a consumer class that spent more than \$20 trillion in just a single year on goods and services at the household level.⁸⁰ That household wealth reflects growing income and shrinking extreme poverty rates by more than two hundred million people.⁸¹ However, notwithstanding this astounding rate of growth, the gap between rich and poor is growing within and between countries. The United Nations Development Program observed in its 2007 annual report that the richest 2 percent of the world’s adult population now owns more than 50 percent of global household wealth, while the bottom 50 percent own barely 1 percent. In other words, “the gains from global growth are being highly unequally distributed.”⁸²

The scale of inequality is reflected in a wide variety of statistical indicators but perhaps the most appropriate for sustainability is the 2007 report entitled *Progress for Children*. Published by the United Nations Infant and Children Fund (UNICEF), the report presents statistical trends on key indicators of health and well-being for children. While the statistics show apparent progress in reducing some of the most severe public health trends, the sheer magnitude of the numbers remain staggering: Annual global deaths of children under age five fell below the 10 million mark, to 9.7 million; 1.5 million children die each year from diarrheal disease associated with lack of sanitation and unsafe drinking water; 143 million children aged five and under suffer from undernutrition in the developing world and nearly one-third of them are “stunted” and will be impaired for life;⁸³ and more than 5 percent of children under the age of five are overweight in twenty developing countries.⁸⁴ The report cites progress in capturing the extraordinary health benefits for children under five of exclusive breast feeding for the first six months of life but also reports that each year 500,000 women in the developing world die from complications of childbirth. HIV/AIDS continues to spread, causing nearly 3 million deaths in 2006; more than 10 million adolescents and young adults

ages 15 to 24 are living with the infection and globally more than 95 percent of those infected are in the developing world. In addition, while some progress has been noted, the number of children out of primary and secondary school was nearly 100 million in 2006 and continued recruitment and forced participation of children in armed conflict and as victims of human trafficking for cheap labor and sexual exploitation continues globally.⁸⁵ The challenge of a global culture of public health, or ensuring what the UNICEF report calls in its subtitle a world fit for children, moves to center stage of cultural responsiveness. Establishing and sustaining such a culture will require sweeping actions and investments from international institutions to the household level in the developed and developing world and clearly runs directly through institutions of higher education.

But as with the climate, ecological, and food systems, the center stage of responsiveness in the cultural system includes many additional challenges that are both equally urgent and interdependent. International development and aid efforts through the United Nations are now being organized around a set of goals that were adopted in September of 2000, known as the Millennium Development Goals (MDGs). The MDGs consist of quantifiable targets to be met by 2015 and focus on social and environmental factors of development.⁸⁶ While the goals themselves have not raised controversy, the origins and actual objectives as well as the means of achieving them have: The Millennium Declaration states that “while globalization offers great opportunities, at present its benefits are very unevenly shared while its costs are unevenly distributed.” Yet the MDGs and the international process of implementation brings a clear set of assumptions that the means of pursuing these goals will be a continuation and expansion of the free trade and privatization orthodoxy of the International Monetary Fund, the World Bank, and the global economic policy of the United States, Europe and Japan.⁸⁷ This concern is deepened by the fact that commitments by wealthy nations to significantly increase Overseas Development Aid (ODA) to provide adequate financing as part of their responsibility to achieving the MDGs have not materialized. In fact, the 2007 MDG progress report from the United Nations found that pledges made in 2005 to double aid to Africa by 2010 have vanished in the face of a *decline* of ODA in real terms of 5.1 percent between 2005 and 2006. The result is that ODA will have to *triple* over the next four years if donors are to deliver on their promises and the goals are to be met. This led the newly elected UN Secretary-General, Ban Ki-moon, to state bluntly that “the world wants no new promises,” and instead he called on “all stakeholders to meet, in their entirety, the commitments already made.”⁸⁸

The breadth of the MDGs bring us back to the contested nature of sustainable development. The Millennium Declaration called for globalization to be “a positive force for all” and this end was pursued through the World Trade Organization 2001 meeting in Doha, Qatar, where trade negotiations failed to arrive at an agreement on improving the prospects of developing countries; those negotiations, known as the Doha round, ultimately broke down in 2006. Notwithstanding claims of lifting nearly 150 million people out of poverty and broad economic benefits for developing countries through trade liberalization, a World Bank report in 2005 revealed that the most likely trade scenario coming out of the Doha round would in fact only minimally benefit some developing nations.⁸⁹ As with sustainable development, contention exists surrounding the authenticity of commitment to the stated values and principles invoked in the Millennium Declaration, including those of human dignity and equality as well as political independence, self-determination, and human rights. The rights and abilities of developing nations to fashion their own development ends and means and to employ public policies, including trade policies with varying degrees of free or restricted trade, to pursue those ends are expressions of cultural independence and cultural development that are fundamental to sustainability.

Throughout this introduction, we have stressed the plural and contested nature of sustainability — a concept like democracy and justice that must be made sense of and worked out on the ground within a diverse array of cultural and ecological settings. We also have emphasized that it cannot mean all things to all people and still have meaning; and that like the closely related concept, quality of life, sustainability has general principles and universal points of reference that provide a grounding for critically appraising and refining localized interpretations. As previously noted, the evolving notion of sustainable development first incorporated culture as a fundamental component, at least in principle, through the work of the World Commission on Culture and Development (the Commission) and its call to bring culture to the center stage of development. The Earth Charter further articulated the foundational role of culture by defining development as “being more, not having more” once basic needs have been met; and this goal of “being more” points to the ethical foundations of sustainability and the central place of culture in determining what “being more” means: The Commission was clear that development and modernization cannot be defined by a uniform, linear path measured by economic growth independent of culture. This same contention and plurality about ends and means is inherent to sustainability, and as a result, sustainability emerges on our campuses as a set of principles and

examples, a work in progress that can be advanced only through participation and engagement in bringing those principles into the rhythm of day-to-day life in a way that enables and empowers all members of the community to define and pursue what it means to “be more.”

Within the framework of the sustainable learning community, we argue that the central place of culture in interpreting sustainability and working it out on the ground requires that it be incorporated *explicitly* into a shared concept of sustainability, which is why it is one of the four primary initiatives. We also argue that cultural self-understanding is an inescapable requirement of a global sustainability outlook and the key to grasping the cosmopolitan nature of sustainability. As noted earlier, cultural self-understanding is an integral part of the citizen of the world and engaged intellectual perspectives, and without it, it is impossible to understand cultural rights as part of basic human rights, human development, and quality of life; and without that understanding, the ultimate significance of sustaining the bases for defining and pursuing quality of life for all people for generations to come, the big idea of sustainability, is lost. Culture serves as a powerful connective tissue linking climate, biodiversity, and food; it provides a vantage point from which the web of interactions within and across these key systems can be traced to a constellation of environmental and social conditions and trends that are in synch or at odds with sustainability. But it goes beyond that. The Commission noted the critical importance of cultural diversity and experimentation to humanity’s creative capacities in the face of a “treasured past and an unpredictable future.” And indeed, creativity is on the agenda for higher education in the form of the creative campus movement driven in part by a pragmatic appreciation for imagination and creativity in industry and economic development.⁹⁰

In diverse cultural and ecological settings, then, quality of life and the means of sustaining human flourishing for generations to come will take a multitude of forms that reflect cultural and ecological inheritance and ongoing engagement in the institutional life of the community or society. But as noted in the previous section, the 2002 World Health Organization report observed a globalizing culture of recklessness: “The world is living dangerously,” it said, either because of poverty or “because it is making the wrong choices in terms of its consumption and its activities.”⁹¹ But what line of reasoning and institutional mechanisms would establish and sustain a uniform culture of recklessness across such a diverse range of cultural and ecological settings? The Commission focused on a concept of development concerned with enhancing the “effective freedom of people involved [in development] to pursue whatever they have reason to value.” They argued that “poverty of

a life, is caused not only by the lack of essential goods and services, but also a lack of opportunities to choose a fuller, more satisfying, more valuable and valued existence.” In other words, culture is the aim of development: the interpretation of cultural and ecological inheritance through engagement in the institutions of the family, education, government, industry, art, religion, and for the majority of the world’s communities the media.⁹² In sustaining a good life for all, economics is one of the means that enables us to “live the way we value”; but what we value and how we conceive of and sustain a human flourishing is, by definition, a matter of culture.

As we saw in previous sections, scenario exercises have been developed to project trends into the future and to illustrate challenges, opportunities, and a range of collective choices before us. While these scenarios take different forms, three general futures looking out to 2050 and beyond that are presented by the Global Scenarios Group provide a productive framing of the cultural challenges and opportunities that we face.⁹³ The first is referred to as “policy reforms,” in which the status quo continues with some degree of strong, coordinated domestic and international policy reform that improves social equity, ecosystem integrity, and development; this is a conventional world with policy reform that, while clearly different than the status quo, would be recognizable to today’s adult population. A second scenario also begins with a continuation of existing values and institutions emphasizing economic growth and trade, but without the policy reform; as a result, problems of climate change, poverty, disease, and political instability overwhelm the adaptive capacity of domestic and international institutions and threaten “unbridled conflict, institutional disintegration, and economic collapse.” In response to this threat, a “fortress world” emerges in which wealthy elites exist in protected enclaves and employ and condone authoritarian means to hold on to their wealth and suppress the impoverished majority who inhabit a deteriorating world of repression, environmental destruction, and misery. The third scenario is referred to as the “great transition,” in which all of the principles of sustainability are realized through fundamental changes in values and novel institutional arrangements and technologies that reflect the shared commitment to high levels of welfare, equality, and ecological integrity.

Taking these three scenarios as reasonable, stylized representations of the range of choices that face us, it is clear that we face enormous challenges *and* opportunities. The implications of stabilizing the climate system through emissions reductions while meeting growing energy demands and reversing the degradation of ecosystems and food systems as well as empowering billions of people to move from a desperate struggle for survival and subsistence

to sustaining a quality of life that affords dignity and meaning are profound. Even the policy reform scenario, while presented as the positive future with the most institutional continuity from our current perspective, assumes *major* policy reforms on the part of governments as well as individual organizations and communities as part of a broad cultural shift away from consumerism and toward the cultivation of quality of life, citizenship, and community. Culturally, a shift from uncritical consumption to the purposeful cultivation of quality of life as a central normative feature of a globalizing culture of sustainability requires active reasoning to be brought to bear on fundamental questions of value within and across the institutional life of our communities and societies. It draws us to questions of quality of life, what it means to “be more.”

An analysis by Global Scenarios Group of how a critical focus on *well-being* can support a transition to a global culture of sustainability invokes a 1930 essay by John Maynard Keynes entitled “Economic Possibilities for our Grandchildren.” In his essay, Keynes envisioned a world in 2030 where “learning to live well had replaced the struggle for subsistence as the basic problem facing humanity.”⁹⁴ The Group’s analysis takes an optimistic view in which global economic growth from 2001 to 2050 matches the rate of growth for the period 1950 to 2000 thereby creating, at least theoretically, sufficient income for all of world’s people to live well. However, this has to be achieved while *reducing* emissions and resource use *and* achieving a relatively equitable distribution of wealth. The way forward focuses on “changing the relationship between well-being and income.” In other words, reinterpreting or perhaps recovering a broadly held conception of the good life in which well-being, or quality of life, becomes the goal and income and consumption are among a broader set of means rather than ends.

Conceptually, the relatively straightforward idea is that income improves quality of life up to a certain point, beyond which its contribution to well-being produces diminishing returns. If one is living in poverty, struggling for subsistence on less than \$2 per day as half of the world’s population is in fact living, then a substantial rise in income will lead to a substantial rise in well-being as food, shelter, clothing, security and access to education are all improved. But once income has reached a level of “comfort,” this argument goes, we arrive at a “fork in the road” where we either continue to pursue well-being as a “by-product of gains in income” or we pursue well-being “directly.” A simple example of limiting or reducing hours of paid work in order to have time to pursue unpaid activities that directly enhance well-being is cited, what is referred to as “time affluence.” Keynes referred to this direct pursuit of well-being as keeping alive and cultivating “the art of life itself,” rather than selling

ourselves “for the means of life.”⁹⁵ A global strategy is presented where developing countries could “leapfrog” to the direct pursuit of well-being rather than pursuing income and consumption to the point of unfulfilling and unsustainable extravagance. In the broader context of sustainability, the idea is that the pursuit of time affluence and other direct elements of well-being will reduce consumption and income among the wealthy and temper the growth in consumption and income among the developing world, thereby contributing to equity while increasing well-being and quality of life.

Culturally, conceptions of well-being and quality of life are part of our cultural inheritance and the argument for their direct pursuit through means such as time affluence is an interpretation of that inheritance. This call for a critical reappraisal of quality of life is rooted in a recognition that the cultural norm of income growth as a proxy for increasing well-being is a convention that was determined socially and is therefore subject to critical reasoning, and can be changed. As the World Commission on Culture and Development observed, the ability to define our own basic needs is a fundamental freedom and a cultural act. In the current age of globalization, public opinion surveys find that the majority of people want to participate in modernity, “but in terms of their own traditions.”⁹⁶ The concern is that modernity appears to have become inseparable from globalization of the consumer culture; the consumer culture is embraced by some, but strongly resisted by others due to deep concerns about its serious threats to culture and the environment.⁹⁷ From a practical point of view, the Commission pointed to the need for a new global ethics to support the high degree of cooperation required to sustain cultural freedom and diversity through shared commitments, values, and principles centered on peace, democracy, and the human, economic, and political rights that underpin human flourishing. This global ethics, then, stands at the center of a global culture of sustainability and without cultural self-awareness, it cannot be grasped.

The Sustainable Learning Community

With the above scenarios and the Commission’s call for a new global ethics in mind, we return to the question of higher education. In each of the preceding sections, we reviewed trends, challenges, and opportunities emerging within and across the climate, ecological, food, and culture systems. We also offered a set of perspectives that, if successfully cultivated in all students, would have the potential to empower them to respond as professionals and

as citizens to the profound challenges and opportunities facing the international community. The transition from a global consumer culture to a global culture of sustainability has many implications for higher education. The previous sections have presented a suite of perspectives and capacities to be cultivated as part of a liberal education: the Earth system, citizen of the world, public health practitioner, and engaged intellectual perspectives. As a normative aspiration, the global culture of sustainability is one that should cultivate our humanity, including what Keynes called “the art of living well,” as well as a creative citizenship reflective of the global ethics envisioned by the Commission that combines inspiration, creativity, and engagement and that sustains the foundation of democracy through the exercise of cultural freedom and human rights. The educational perspectives presented in this chapter are part of a long-standing dialogue within our own Western culture on the question of what constitutes a good citizen and the kind of education that cultivates and empowers a good citizen. As noted by Martha Nussbaum in her book *Cultivating Humanity*,

When we ask about the relationship of a liberal education to citizenship, we are asking a question with a long history in the Western philosophical tradition. We are drawing on Socrates’ concept of “the examined life,” on Aristotle’s notions of reflective citizenship, and above all on Greek and Roman Stoic notions of an education that is “liberal” in that it liberates the mind from the bondage of habit and custom, producing people who can function with sensitivity and alertness as citizens of the whole world.⁹⁸

The point is not that habit and custom are inherently bad or good, but that the examined life is conscious, purposeful, and reasoned, so that customs and habits that hold up to reasoned argument are sustained and those that do not give way to what are determined to be better ways of living. In terms of who decides or determines the virtue or vice of cultural norms, we have cast our lot with democracy and liberal education, themselves major inheritances of Western culture. Nussbaum argues that understanding the classical origins of liberal education as a vital part of our cultural inheritance not only helps us to recover powerful and formative arguments that have shaped our contemporary democracy, but it also enables us to recognize that the U.S. system of higher education, built as it is upon a liberal arts foundation, has incorporated these classical ideals “to a degree unparalleled in the world.” This recognition is part of the cultural self-awareness that is so fundamental to the sustainable learning community.

The outlook of a global culture of sustainability builds directly upon the classical tradition of liberal education and the perspectives and abilities it cultivates. Nussbaum presents three capacities that are fundamental to liberal education: self-criticism, self-identification as a citizen of the world, and the ability to imagine the world critically from the perspective of others.⁹⁹ The capacity for self-criticism entails critical examination of “oneself and one’s traditions,” the examined life that Socrates implored us to live, a life of reason that cultivates the cultural self-awareness and critical and creative engagement we’ve referred to previously. This is a capacity and an outlook “that questions all beliefs and accepts only those that survive reason’s demand for consistency and for justification.” In other words, education is not the passive acculturation or uncritical acceptance of traditional values or familiar habits, be they within disciplines or public policies, but the ability and commitment to critical thinking and reasoning and doing what is deemed best in light of that reasoning. Educationally, then, it is less a matter of memorization and more a matter of *interpretation* or, as the Stoic philosopher Seneca observed, “It is one thing to remember, another to know.” Nussbaum makes a compelling argument for the enduring importance of liberal education:

It is not good for democracy when people vote on the basis of sentiments they have absorbed from talk radio and have never questioned. This failure to think critically produces a democracy in which people talk at one another but never have a genuine dialogue. In such an atmosphere bad arguments pass for good arguments, and prejudice can all too easily masquerade as reason. To unmask prejudice and to secure justice, we need argument, an essential tool of civic freedom.¹⁰⁰

As noted before, the ability to identify oneself as a citizen of the world extends and strengthens the capacity of all graduates to cultivate a cosmopolitan outlook that recognizes diverse cultural systems and common human concerns. This outlook, as Nussbaum argues, lies at the origin of Socratic questioning and dialogue and ethical reasoning: If our norms and conventions are cultural, as evidenced by the diversity of norms and conventions that exist in the wider world, then critical reflection and examination will either uphold those norms and conventions, or will discover alternatives. The citizen of the world perspective is an identity that transcends more immediate political, religious, and racial identities and nurtures respect; it does not replace or displace one’s local commitments and responsibilities or self-identity, but rather enriches their ongoing interpretation. It also facilitates the integration of the Earth system and public health practitioner perspectives and strengthens

intellectual independence and the ability to reason with others about our collective choices rather than just trading claims and counterclaims.¹⁰¹

Nussbaum's third capacity, the narrative imagination, further enriches critical thinking and interpretation by cultivating the ability "to think what it might be like to be in the shoes of a person different from oneself." This is a creative act that is based on more than factual knowledge; it is a willingness and ability to empathize with a perspective that may be very different from one's own. This is not a suspension of critical thinking or an embracing of moral relativism, but rather part of a robust process of reasoning, for as Nussbaum notes, "the first step of understanding the world from the point of view of the other is essential to any responsible act of judgment." Through the creative act of empathy, one is able to identify with and decipher the meaning and true intention of an action within the context of another's history and social world. Here Nussbaum points to a long-established recognition of the value of the arts, and literature in particular, for citizenship and deliberative democracy through the cultivation of what she refers to as the narrative imagination.¹⁰² It is the cultivated imagination that can see possibilities and alternatives and stir compassion and sympathy for others who may appear very different from ourselves.

As we consider these ancient and contemporary insights, we ask, as we did in the case of climate, biodiversity, and food, what form will our sustainable learning community take to provide the experiences, intellectual grounding, and persuasiveness that the coming generations of our graduates will need to advance sustainability? Not surprisingly, we again emphasize the importance of continuity across the curriculum, operations, research, and engagement functions of the university so that students can appreciate how the knowledge residing in disparate disciplines, professions, and practices can be brought together to improve and sustain community life. The ancient Greek philosophers recognized that "the polis teaches." Whether one thinks of it as socialization, acculturation, or something else, the upshot of this insight is the same: The community teaches, and learning results from the community experience of the learners, not simply what takes place in a classroom. The sum total of our core values and mission and our practices across all aspects of the CORE add up to a powerful cultural and educational force.

So, for example, the case study on Sustaining Democracy described in the Culture and Sustainability section of chapter 5 captures the effort to link a democratic, participatory culture to real problems facing the university community just as the Outreach Scholars program described in that same section and the Carsey Institute described in the Culture and Sustainability section

of chapter 4 extend research and scholarship across campus and into local, regional, and national communities through engaged partnerships beyond the campus aimed to supporting communities in their efforts to sustain quality of life. Creativity and collaboration to achieve shared educational goals are seen across numerous case studies that follow, including “Developing a Theatrical Response to Sustainability,” described in chapter 2, the “Growing a Green Generation” described in chapter 4, and the development of public art guidelines and commissioning of a figurative sculpture described in “Developing a Sense of Place” in chapter 3. In these and the other programs discussed in the case studies, a genuine sense of place is being cultivated that integrates the ecological concerns of the Earth system, the effort to build a resilient community that supports the goals of the public health practitioner, the cultural self-awareness of the citizen of the world, and the commitment of the engaged intellectual. As students, faculty, and staff become more aware of the active critical and creative interactions of these and many other projects, the full import of the potential and actual impact of the sustainable learning community is apprehended, and learners become aware that they are in the community and it is in them and that the impact is mutual and ongoing.

The global sustainability outlook grows from a cultural perspective in which individuals identify as both citizens of the world and citizens of the Earth even as they engage fully in their immediate communities: what has been called “rooted cosmopolitanism.”¹⁰³ The Stoic idea of *kosmou polites*, literally citizen of the cosmos, but more generally understood as citizen of the world, describes an integrated identity envisioned as a series of expanding concentric circles that extend from the individual to the family, community, state, nation, world, and ultimately to the greater cosmos. The treatment of the citizen of the world within liberal education is normally explicitly or at least implicitly limited to human-to-human relations, but if we take the Stoic idea of extending our identity to the cosmos and the gods and laws that shape it, then we have a basis for drawing that identity back in toward the individual situated in community, bringing with it not just all human beings and their diverse cultures and shared moral capacity and ability to reason, but the Earth system and the entire community of life. The Earth system perspective makes clear that we are indeed intimately connected to the cosmos: The relationship of the Earth to the Sun and the myriad interactions that give rise to life, including human life, on the third planet from the Sun are now scientifically understood and accessible on a level that would have been almost impossible to imagine fifty years ago, let alone when the Stoic philosophers argued for the virtues of educating the *kosmou polites*.

The Apollo 11 image of the Earth from space has arrived at an iconic status across the globe. And as powerful as it is, our identity as citizens of the cosmos may be even more clearly expressed by what came to be known as the “pale blue dot,” the first picture of the Earth taken from deep space (6.4 billion kilometers away) that shows our planet as a tiny, pale blue dot against the enormous backdrop of space. This image captured the Earth in all of its majesty and insignificance. The astronomer Carl Sagan published a book in 1994 based on that image entitled *Pale Blue Dot*; in an often quoted excerpt, Sagan refers to the Earth as “a very small stage in a vast cosmic arena” and articulates what we might call a succinct, popular ethos of the citizen of the cosmos:

There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we’ve ever known.¹⁰⁴

The global sustainability outlook that the sustainable learning community endeavors to cultivate in all its members incorporates the Earth system, our human world of diverse cultures and common capacities, the responsibility of respect and compassion that underpins public health and human rights and the inspired imagination and aesthetic sensibilities that reflect a rooted cosmopolitanism, or a global culture of sustainability. Within this culture, we must interpret our cultural and ecological inheritance, with all of its diversity, using what the Stoics recognized as the common human capacity for critical searching and a love of truth. That education is fundamental to this shared human responsibility to interpret our inheritance and bequeath it as a legacy to the next generations is clear. That a truly liberal education can provide a basis for the global dialogue that must transcend a clash of brute interests and impulses to serve a common good is also clear.

Sustainability, it turns out, has pulled us all back from our scattered modernity to face the ancient questions of civilization: What is a good life and how do we sustain a good life for ourselves and future generations on the only pale blue dot that we know of that can sustain life? This is not an abstract question: We have reviewed the profound challenges and choices that we face as an international community. Our ability to argue, listen, understand, and persuade within the context of an entirely new level of cooperation and collaboration is pivotal for the coming generations and our legacy. Sustainability — this big, contested, cosmopolitan, and practical idea that must be worked out on the ground — connects our most pressing problems and engages our creative and

moral imagination to “be more” and help to build a world where everyone can do the same. This is a subject and a challenge perfectly suited to a liberal education. We argue here that the global sustainability outlook that can inspire students in all fields builds directly upon the classical tradition of liberal education and the outlook and abilities it cultivates; and that when the perspectives of the Earth system, citizen of the world, public health practitioner, and engaged intellectual are integrated, a concrete body of knowledge, skills, and outlooks emerges that defines the learning foundation of the sustainable learning community. The sustainable learning community model is a modest effort to interpret our inheritance of liberal education in search of a community of reason that is responsive to our world and in so doing, cultivates a responsive individual or a citizen of the cosmos.

Notes

1. Martha C. Nussbaum, *Cultivating Humanity: A Classical Defense of Reform in Liberal Education* (Cambridge, Mass.: Harvard University Press, 1997).
2. W. Steffen et al., *Global Change and the Earth System: A Planet Under Pressure* (Stockholm: IGBP Secretariat Royal Swedish Academy of Sciences, 2004), 5.
3. Kofi A. Annan, *We the Peoples: the Role of the United Nations in the 21st Century* (New York: United Nations, 2000), 5.
4. *Our Common Future, Report of the World Commission on Environment and Development* (Oxford: Oxford University Press, 1987). The WCED is also known as the Brundtland Commission, for Gro Harlem Brundtland, the former Prime Minister of Norway.
5. See Martha C. Nussbaum and Amartya Sen, eds., *The Quality of Life* (New York: Oxford University Press, 1993).
6. The Latin word *integritas* is an abstract noun formed from the Latin adjective *integer*, “whole” or “unblemished.” The adjective itself comes from *in + tango*, “untouched.” The noun could be used for body or soul: integrity of the eyes, for example, meant good eyesight; integrity of the soul meant unblemished. Thanks to R. Scott Smith of the UNH Classics Program for this footnote.
7. Sustainability has much in common with “quality of life,” including discussions over universal and relative bases for assessment. For an important discussion of this tension, see Martha Nussbaum, “Non-Relative Virtues: An Aristotelian Approach,” in *The Quality of Life*, 242–69.
8. For example, see Timothy Doyle, “Sustainable Development and Agenda 21: The Secular Bible of Global Free Markets and Pluralist Democracy,” *Third World Quarterly* 19, no. 4 (December 1, 1998): 771–86. See also Michael Redclift, *Sustainable Development: Exploring the Contradictions* (London: Methuen, 1987); Arturo

Escobar, *Encountering Development: The Making and Unmaking of the Third World, 1945–1992* (Princeton, N.J.: Princeton University Press, 1995); Subhabrata Bobby Banerjee, “Who Sustains Whose Development? Sustainable Development and the Reinvention of Nature,” *Organizational Studies* (January 2003).

9. WCED, *Our Common Future*.
10. A concise review and analysis is provided in Robert W. Kates, Thomas M. Parris, and Anthony A. Leiserowitz, “What is Sustainable Development? Goals, Indicators, Values, and Practice,” *Environment: Science and Policy for Sustainable Development* 47, no. 3 (2005): 8–21. For Agenda 21, see <http://www.un.org/esa/sustdev/documents/agenda21/index.htm>.
11. *Our Common Future*, quoted in Kates (2005), 8.
12. Doyle, “Sustainable Development,” 774.
13. Banerjee, “Who Sustains Whose Development?” 24.
14. Kates, Parris, and Leiserowitz, “What Is Sustainable Development?” 10. Important conferences that preceded the WCED included the 1972 Stockholm Conference on the Human Environment and the 1980 World Conservation Strategy of the International Union for the Conservation of Nature. In addition, the UN Population Commission was established in 1946 and the first world population conference under the auspices of the United Nations took place in Rome in 1954, followed by the second, which focused on population in Asia, in 1963 in New Delhi, the third in 1974 in Bucharest, the fourth in 1984 in Mexico City. Subsequent to *Our Common Future*, the International Conference on Population and Development took place in Cairo. For a summary, see <http://www.un.org/popin/icpd/conference/bkg/unpop.html>.
15. Banerjee, “Who Sustains Whose Development?” 8.
16. See, for example, United Nations, *Programme for the Further Implementation of Agenda 21* (New York: United Nations, 1997), 7–21. Document available at <http://www.un.org/documents/ga/res/spec/aress19-2.htm>. See also Earth Summit +5 Portal, <http://www.un.org/ecosocdev/geninfo/sustdev/indexsd.htm>; and United Nations, *Industry as a Partner for Sustainable Development: 10 Years after Rio: The UNEP Assessment* (London: UNEP, 2002), 8–9.
17. See Joseph Stiglitz, *Globalization and its Discontents* (New York: W. W. Norton, 2002).
18. Doyle, “Sustainable Development,” 779.
19. United Nations, Education, Scientific and Cultural Organization, *UNESCO General Conference Twenty-Seventh Session Information Document* (Paris: UNESCO, 1993), 2. Document available at <http://unesdoc.unesco.org/images/0009/000957/095724Eo.pdf>.
20. United Nations, Education, Scientific and Cultural Organization, *Our Creative Diversity: Report of the World Commission on Culture and Development* (Paris: UNESCO, 1996), 7. Document available at <http://unesdoc.unesco.org/images/0010/001055/105586e.pdf>.

21. United Nations General Assembly, *International Covenant on Economic, Social and Cultural Rights* (New York: United Nations General Assembly G.A. res. 2200A (XXI), 1976). Document available at <http://www1.umn.edu/humanrts/instree/b2esc.htm>.
22. See Orin Kirschner, ed., *The Bretton-Woods-GATT System: Retrospect and Prospect after Fifty Years* (Armonk, N.Y.: M.E. Sharpe for the Institute for Agriculture and Trade Policy, 1996).
23. United Nations General Assembly, *United Nations Millennium Declaration* (New York: United Nations General Assembly A/55/L.2, 2000). Document available at <http://www.un.org/millennium/declaration/ares552e.pdf>.
24. See the Earth Charter Initiative at <http://www.earthcharter.org/> (accessed July 2008).
25. All related documents are available on the United Nations website, <http://www.un.org/esa/sustdev/documents/agenda21/index.htm> (accessed July 2008). The breadth of sustainability is readily visible in the forty chapters of the Earth Summit's Agenda 21 that are organized around four headings: (1) Social and Economic Dimensions; (2) Conservation and Management of Resources for Development; (3) Strengthening the Role of Major Groups; and (4) Means of Implementation. See also http://earthcharterinaction.org/about_charter.html, and Nussbaum and Sen, *The Quality of Life*.
26. Walter V. Reid et al.: *Ecosystems and Human Well-Being: Synthesis, A Report of the Millennium Ecosystem Assessment* (Washington, D.C.: Island Press, 2005), 1. Document available at <http://www.millenniumassessment.org/documents/document.356.aspx.pdf>.
27. *Ibid.*, 17.
28. The MA defines ecosystem services as the "benefits people obtain from ecosystems," and organize those benefits into the following categories:
 1. *provisioning services* such as food, water, timber, and fiber;
 2. *regulating services* that affect climate, floods, disease, wastes, and water quality;
 3. *cultural services* that provide recreational, aesthetic, and spiritual benefits; and
 4. *supporting services* such as soil formation, photosynthesis, and nutrient cycling.
29. Reid et al., *Ecosystems and Human Well-Being*, 4.
30. See also United Nations Environment Programme, "Climate Change Threat to Pacific Ocean Mangroves," *Environment for Development*, <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=483&ArticleID=5312&l=en> (accessed July 2008).
31. Paula J. Dobriansky, "Renewing the Commitment," in *Our Planet* [Nairobi, United Nations Environment Program] 14, no. 1 (2003). Document available <http://www.ourplanet.com/imgversn/141/images/Our%20Planet%2014.1.pdf> (accessed July 2008).

32. Reid et al. *Ecosystems and Human Well-Being*, 12.
33. *Ibid.*, 15.
34. *Ibid.*, 1 (emphasis added).
35. *Ibid.*, 92.
36. See the World Bank PovertyNet website, <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/EXTPA/o,,contentMDK:20040961~menuPK:435040~pagePK:148956~piPK:216618~theSitePK:430367,00.html> (accessed July 2008).
37. *Ibid.*
38. Adam Wagstaff, "Policy and Practice Theme Papers: Poverty and Health Sector Inequalities," *Bulletin of the World Health Organization* 80, no. 2 Geneva 2002. Document available http://www.scielosp.org/scielo.php?pid=S0042-96862002000200004&script=sci_arttext&tlng= (accessed July 2008).
39. Reid et al. *Ecosystems and Human Well-Being*, 11.
40. Lenny Bernstein, et al., *Climate Change 2007: Synthesis Report, Summary for Policymakers* (New York: United Nations Environment Program, 2007). Document is available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf (accessed July 2008). For background and all related documents, see <http://www.ipcc.ch/#>.
41. P. N. Pearson and M. R. Palmer, "Atmospheric Carbon Dioxide Concentrations over the Past 60 Million Years," *Nature* 406 (2000): 695–99. See also U. Siegenthaler, T. F. Stocker, E. Monnin, D. Lüthi, J. Schwander, B. Stauffer, D. Raynaud, J-M Barnola, H. Fischer, V. Masson-Delmotte, and J. Jouzel, "Stable Carbon Cycle–Climate Relationship During the Late Pleistocene" *Science* 310 (2005): 1313–17. DOI: 10.1126/science.1120130.
42. Bernstein et al., *Climate Change 2007*, 3.
43. *Ibid.*, 12–14.
44. See Eric Klinenberg, *Heat Wave: A Social Autopsy of Disaster in Chicago* (Chicago: University of Chicago Press, 2002). Quotation taken from interview with Klinenberg, July 2008, available at <http://www.press.uchicago.edu/Misc/Chicago/443213in.html>.
45. Ulisses Confalonieri et al., "Human Health," in *Climate Change 2007: Impacts, Adaptation and Vulnerabilities*, ed. Martin Parry et al. (New York: United Nations Environment Program, 2007). Document is available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter8.pdf> (accessed July 2008).
46. Susan Cutter, "The Geography of Social Vulnerability: Race, Class, and Catastrophe," in *Understanding Katrina: Perspectives from the Social Sciences*, <http://understandingkatrina.ssrc.org/Cutter/> (accessed July 2008).
47. Julian Borger, "Climate Change Disaster Is Upon Us, Warns UN," *Guardian Unlimited*, October 5, 2007, <http://www.guardian.co.uk/environment/2007/oct/05/climatechange> (accessed July 2008).

48. P. Schwartz and D. Randall, "An Abrupt Climate Change Scenario and Its Implications for United States National Security." Global Business Network, Emeryville, Calif., October 2003. Available online through *Grist Magazine* on <http://gristmagazine.com/pdf/AbruptClimateChange2003.pdf> (accessed June 2008).
49. For example, the AR4 concludes that even if concentrations of all greenhouse gases and aerosols had been kept constant at year 2000 levels, a warming of about 0.1°C per decade would be expected. See Bernstein et al., *Climate Change 2007*, 12.
50. Sir Nicholas Stern, *The Stern Review on the Economics of Climate Change*, http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm (accessed July 2008).
51. *Ibid.*, iii
52. Steffen et al., *Global Change*, 14.
53. For a contemporary discussion see http://www.motherjones.com/interview/2006/02/anthony_appiah.html (accessed July 2008).
54. See <http://www.un.org/depts/dhl/maplib/flag.html>. The official document establishing this emblem is available at <http://www.un.org/depts/dhl/maplib/docs/a107.pdf>.
55. Dabney P. Evans, "Public Health and Human Rights: Along the Long Arc of Justice," *One World: Global Focus* (Washington, D.C.: American Public Health Association, 2006).
56. "New Film Declares Obesity Epidemic a 'Killer at Large,'" *NewsWireToday*, October 25, 2007, <http://www.newswiretoday.com/news/25327/> (accessed July 2008).
57. *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity 2001* (Rockville, Md.: U.S. Department of Health and Human Services Public Health Service Office of the Surgeon General, 2001). Document available at <http://www.surgeongeneral.gov/topics/obesity/calltoaction/CalltoAction.pdf> (accessed July 2008).
58. *Surgeon General's Call*, xiii. The CDC quote is within a press release available at <http://www.cdc.gov/od/oc/media/pressrel/r2k1004a.htm> (accessed July 2008).
59. *World Health Report 2002* (Geneva: World Health Organization, 2002). Document is available at <http://www.who.int/whr/2002/en/> (accessed July 2008). "Burden of disease" is defined as the total significance of disease for society beyond the immediate cost of treatment. It is measured in years of life lost to ill health as the difference between total life expectancy and disability-adjusted life expectancy. See "Disability Adjusted Life Years" at <http://www.who.int/healthinfo/bodabout/en/index.html> (accessed July 2008).
60. Indoor smoke results from the use of solid fuels including dung, charcoal, wood, and crop residues for cooking and heating. See *Indoor Smoke from Solid Fuels*:

Assessing the Environmental Burden of Disease, Environmental Burden of Disease series no. 4 (Geneva: World Health Organization, 2004). Document is available at http://www.who.int/quantifying_ehimpacts/publications/9241591358/en/ (accessed July 2008).

61. *Ibid.*, 10.
62. *World Health Report 2002*, 10.
63. For the World Food Summit, see *Rome Declaration on World Food Security* (Rome: United Nations Food and Agriculture Organization, 1996). Documents available at http://www.fao.org/wfs/index_en.htm. For the World Bank report, see *World Development Report 2008: Agriculture for Development* (Washington, D.C.: The World Bank, 2008). Document available at <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTWDRS/EXTWDR2008/0,,contentMDK:21410054~menuPK:3149676~pagePK:64167689~piPK:64167673~theSitePK:2795143,00.html>. For the IAASTD, see Tsedeke Abate et al., *International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) Executive Summary Report* (Washington, D.C.: IAASTD Secretariat, 2008). Document available at <http://www.agassessment.org/>. (All websites accessed July 2008.)
64. Sophia Murphy and Tilman Santarius, *The World Bank's WDR 2008: Agriculture for Development, Response from a Slow Trade—Sound Farming Perspective, Ecofair Trade Dialogue Discussion* (Washington, D.C.: Heinrich Boll Foundation North America Ecofair Trade Dialogue Implementation Papers, no. 1, October 2007). Document available at http://www.boell.org/docs/WDR2008_SlowTrade_Critique.pdf (accessed July 2008).
65. Leif E. Christoffersen et al., *Report of the Independent External Evaluation of the Food and Agriculture Organization of the United Nations (FAO)* (Rome: Food and Agriculture Organization of the United Nations, 2007), 3. Document available at <ftp://ftp.fao.org/docrep/fao/meeting/012/ko827e02.pdf> (accessed July 2008).
66. Christoffersen et al., *Report of the Independent External Evaluation*, 8.
67. Mark Muller et al., *Conference Summary: The Wingspread Conference on Childhood Obesity, Healthy Eating and Agriculture Policy—March 2007* (Minneapolis: Healthy Eating Research, 2007), 9. Document available at <http://www.healthobservatory.org/library.cfm?refid=99598> (accessed July 2008).
68. Daryll E. Ray, Daniel G. De La Torre Ugarte, and Kelly J. Tiller, "Rethinking U.S. Agricultural Policy: Changing Course to Secure Farmer Livelihoods Worldwide" (Chattanooga: Agriculture Policy Analysis Center, the University of Tennessee, 2003), Executive Summary, 1.
69. Ben Lilliston, ed., *A Fair Farm Bill for the World* (Minneapolis: Institute for Agriculture and Trade Policy, 2007), 1. Document available at <http://www.agobservatory.org/library.cfm?refid=97624> (accessed July 2008).
70. Fred Kirschenmann et al., *Why Worry about the Agriculture of the Middle? A*

- White Paper for the Agriculture of the Middle Project, <http://www.agofthe middle.org/papers/whitepaper2.pdf> (accessed July 2008).
71. See Tsegede Abate et al., *International Assessment*
 72. Anantha Kumar Duraiappah and Shahid Naeem et al., *Millennium Ecosystem Assessment: Ecosystems and Human Well-Being: Biodiversity Synthesis* (Washington, D.C.: World Resources Institute, 2005), 8.
 73. See, for example, "Organic Agriculture Can Contribute to Fighting Hunger" (Rome: United Nations Food and Agriculture Organization of the United Nations, FAO Newsroom, December 2007). Document available at <http://www.fao.org/newsroom/en/news/2007/1000726/index.html> (accessed July 2008).
 74. Catherine Badgley et al., "Organic Agriculture and the Global Food Supply," *Renewable Agriculture and Food Systems* 22, no. 2: 86–108.
 75. Michael Windfuhr and Jennie Jonsen, *Food Sovereignty: Towards Democracy in Localized Food Systems* (Warwickshire, UK: ITDG Publishing, The Schumacher Centre for Technology and Development, 2005), 1. Document available at http://www.ukabc.org/foodsovereignty_itdg_fian_print.pdf (accessed July 2008).
 76. Ibid.
 77. See Tsegede Abate et al. *International Assessment*, 8.
 78. The origins and emergence of consumer culture is a complex and contested area of discussion and scholarship. For example, see Kathy L. Peiss, "American Women and the Making of Modern Consumer Culture," *The Journal for Multi Media History* 1, no. 1 (1998). Document available at <http://www.albany.edu/jmmh/vol1no1/peiss-text.html> (accessed July 2008).
 79. *World Trade Report 2007* (Geneva: World Trade Organization Secretariat, 2007). Document available at http://www.wto.org/english/res_e/booksp_e/anrep_e/wtro7-ob_e.pdf (accessed July 2008). According to the report, global trade has grown twenty-seven fold in volume terms since 1950, or three times faster than world output growth, "mainly due to the creation of a multilateral trading system, which has been upheld by the WTO and its predecessor, the Generalized Agreement on Tariffs and Trade (GATT), over the past 60 years."
 80. Brian Halweil et al., *State of the World 2004 Special Focus the Consumer Society* (Washington, D.C.: World Watch Institute, 2004).
 81. The World Bank, China Country Brief, <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,menuPK:318960~pagePK:141132~piPK:141107~theSitePK:318950,00.html> (accessed July 2008).
 82. UNDP, *Making Globalization Work for All: United Nations Development Programme Annual Report 2007* (New York: United Nations Development Programme, 2007), 1.
 83. Stunting refers to shortness for age and an indicator of chronic malnutrition.

- See World Food Programme, "What is Hunger?" http://www.wfp.org/aboutwfp/introduction/hunger_what.asp?section=1&sub_section=1 (accessed July 2008).
84. UNICEF, *Progress For Children: A World Fit for Children* (New York: United Nations Children's Fund Statistical Review Number 6, 2007). Document available at http://www.unicef.org/publications/files/Progress_for_Children_No_6.pdf (accessed July 2008).
 85. *Child Soldiers Global Report 2008* (London: Coalition to Stop the Use of Child Soldiers, 2008). See also "Child Protection from Violence, Exploitation and Abuse," *Child Trafficking*, United Nations Children's Fund, at http://www.unicef.org/protection/index_exploitation.html (accessed July 2008).
 86. United Nations, General Assembly, *United Nations Millennium Declaration*.
 87. Samir Amin, "The Millennium Development Goals: A Critique from the South," *Monthly Review* 57 (March 10, 2006).
 88. *The Millennium Development Goals Report 2007* (New York: The United Nations, 2007), 3. The report reveals that only five donor countries have reached or exceeded the long-standing United Nations target of devoting 0.7 percent of their gross national income (GNI) to development aid: Denmark, Luxembourg, the Netherlands, Norway, and Sweden.
 89. Timothy A. Wise, "Doha Round's Development Impacts: Shrinking Gains and Real Costs" (Medford, Mass.: Global Development and Environment Institute RIS Policy Brief, No. 19, November 2005).
 90. See, for example, the work of Stephen Tepper of Vanderbilt University's Curb Center for Art, Enterprise and Public Policy on the Creative Campus. Document available at <http://www.vanderbilt.edu/curbcenter/creativecampus>, <http://www.vanderbilt.edu/curbcenter/insidearts>, http://www.aacu.org/peerreview/pr-spo6/pr-spo6_analysis1.cfm. See also discussion by Deborah Wince-Smith at http://www.aacu.org/peerreview/pr-spo6/pr-spo6_analysis3.cfm; and Ellen McCulloch-Lovell http://findarticles.com/p/articles/mi_qa3895/is_200507/ai_n14800663. In addition, the University of Alabama has a Creative Campus office that is bridging many aspects of campus life in a manner that is very consistent with sustainability. See <http://creativecampus.ua.edu/documents/yearend.htm>. The Boston Indicators Project is an Innovate project incorporating civic vitality, cultural life, and the arts. See <http://www.tbf.org/indicators/project/default.aspx>. Two relevant Canadian examples include "Making the Case for Culture," at <http://www.creativecity.ca/resources/making-the-case/index.html> and "Culture as a Key Dimension of Sustainability," at <http://www.cultureandcommunities.ca/downloads/WP1-Culture-Sustainability.pdf> (all websites accessed July 2008).
 91. *World Health Report 2002*, 10.
 92. "Overview," International Telecommunication Union, <http://www.itu.int/ITU-D/digitaldivide/> (accessed July 2008).

93. The three scenarios outlined above are those of the Global Scenarios Group; see http://www.gsg.org/scenario_descriptions.html (accessed July 2008).
94. John Maynard Keynes, "Economic Possibilities for our Grandchildren," <http://www.econ.yale.edu/smith/econ116a/keynes1.pdf> (accessed July 2008).
95. *Ibid.*, 5.
96. UNESCO, *Our Creative Diversity*, 28 (see n. 20).
97. "World Publics Welcome Global Trade—But Not Immigration," *Pew Global Attitudes Project*, Pew Research Center, October 4, 2007, <http://pewglobal.org/reports/display.php?ReportID=258> (accessed July 2008).
98. Nussbaum, *Cultivating Humanity*, 8 (see n. 1).
99. *Ibid.*, 9.
100. The Seneca quote in Nussbaum continues, "To remember is to safeguard something entrusted to the memory. But to know is to make each thing one's own, not to depend on the text and always to look back to the teacher. 'Zeno said this, Cleanthes said this.' Let there be a space between you and the book." Quoted in *ibid.*, 35.
101. *Ibid.*, 19.
102. *Ibid.*, 85.
103. Kwame Anthony Appiah, "Cosmopolitan Patriots," *Critical Inquiry* 23, no. 3 (Spring 1997): 618.
104. Carl Sagan, *A Pale Blue Dot: A Vision of the Human Future in Space* (New York: Random House, Inc., 1994). Quote from "An Excerpt from *A Pale Blue Dot*," *Space Topics: Voyager*, the Planetary Society, http://www.planetary.org/explore/topics/voyager/pale_blue_dot.html (accessed July 2008).