

# **Third National Conference on Science, Policy and the Environment: Education for a Sustainable and Secure Future**

*[National Council for Science and the Environment](#)*

## **DRAFT BACKGROUND DOCUMENT**

This draft document has been prepared as background for the 3<sup>rd</sup> National Conference on Science, Policy and the Environment: Education for a Sustainable and Secure Future, January 30-31, 2003 in Washington, DC. It is intended to provide a background in some of the key issues that will be addressed at the conference. The goals, objectives and an overview of the upcoming conference are also presented.

The National Council for Science and the Environment greatly appreciates the hard work of the conference planning committee members who prepared this report: Wynn Calder, Warren Flint, Jaimie Cloud, David Sherman, Kim Lamphier, Dick Bartlett and Mary Paden and thanks other planning committee members, particularly Walter Leal Filho for their contributions.

We encourage and welcome comments and suggestions for improving this draft, which we hope to publish after the conference.

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## **Background: OVERVIEW AND INTRODUCTION**<sup>1</sup>

### **Why Does Education Matter?**

Ecological disorder reflects a prior disordering of thought, perceptions and values. The ecological crisis is a crisis of mind, which makes it a challenge for those institutions which purport to improve minds. It is, in other words, an educational crisis.<sup>2</sup>

Why is it important for education in the United States--and indeed elsewhere-- to commit to ensuring a sustainable and secure future? First, as most of the literature in this field points out, it is important from a moral perspective. Since our schools and universities educate our citizens and train our future community and business leaders, teachers and policy makers, these institutions bear a moral responsibility to provide the expertise and vision needed to foster a sustainable future. Furthermore, academic freedom, tax-free status and public resources are granted American educational institutions in exchange for the dissemination of knowledge and values to ensure the health and well-being of society.<sup>3</sup>

Second, our educational institutions should pursue this course from a practical perspective: they are uniquely equipped to help solve the challenge of sustainability through innovation in teaching and learning. Sustainability is more than a framework for categorizing environmental, social and economic challenges; it is also a way of thinking about these issues. If people do not learn to think about global environmental degradation and poverty in a more effective way, we will continue to make little progress in reducing them. Education for sustainability (EFS) calls for integrated decision-making based on integrated information to enable individuals, organizations, institutions, businesses and governments to incorporate environmental considerations and goals into social, economic (and even security) decisions. Part of the intellectual challenge of sustainable development, therefore, is that it involves learning how to solve several problems at once. Education can give students and future leaders the intellectual tools for doing that.

Third, a U.S. commitment to the research and teaching of sustainability matters because the U.S. educational enterprise influences the standards and practice for education throughout the world. American colleges and universities serve more international students than in any other country. It is incumbent upon American education to contribute to solving the global challenge of sustainable development.

### **A Brief History of Education for Sustainability**

Beginning with the United Nations Conference on the Human Environment (Stockholm Conference) in 1972, there has been growing international interest in the role of education in fostering a sustainable future. *Agenda 21*, the extensive blueprint for

building a sustainable world that came out of the Earth Summit (UN Conference on Environment and Development) in 1992, made this agenda explicit. International conferences in the 1990s and official declarations, especially for higher education, helped to clarify the meaning of education for sustainability (EFS) and fostered numerous examples, in the U.S. and abroad, of commitment to sustainability in the teaching, research, outreach and operations of schools and universities. Although the 2002 World Summit on Sustainable Development produced mixed results for education, new declarations and international partnerships for education emerged. The Summit recommended that the United Nations General Assembly declare a Decade of Education for Sustainable Development to begin in 2005, a decision that would help bring renewed global attention to the issue. The General Assembly has voted on and approved the Decade.

Principle 19 of the Stockholm Declaration (1972) calls for environmental education from grade school to adulthood to “broaden the basis for enlightened opinions and responsible conduct by individuals, enterprises and communities in protecting and improving the environment in its full human dimension.”<sup>4</sup> In 1977, the Intergovernmental Conference on Environmental Education in Tbilisi produced the first international declaration on environmental education.<sup>5</sup> The Tbilisi Declaration promoted environmental teaching, research and training, as well as technical and vocational education. It also recognized the essential interdisciplinary nature of environmental education:

Environmental education... is necessary for students in all fields, not only natural and technical sciences, but also social sciences and arts, because the relationship between nature, technology and society mark and determine the development of a society.<sup>6</sup>

After some stagnation during the 1980s, a growing awareness of environmental problems such as climate change and biodiversity loss, the report of the World Commission on Environment and Development ((also known as the Brundtland Commission since it was chaired by Gro Harlem Brundtland, then Prime Minister of Norway),<sup>7</sup> and preparations for the Earth Summit, gave new international attention to the issue of education for sustainability and the environment in the early 1990s. The term “education for sustainability” (or “education for sustainable development”) emerged primarily out of the Earth Summit and for many educators is defined more broadly than “environmental education” to include issues of international development, cultural diversity and social and environmental equity.

Aside from the word “government,” “education” appears more often than any other term in the Earth Summit’s comprehensive plan for global sustainability - *Agenda 21*. Education underlies and has the potential to reinforce every other priority in this comprehensive document. Chapter 36 of *Agenda 21*, on “Education, Public Awareness and Training” states, “education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues.” It touches on most of the major priorities of EFS today: cross-disciplinary curriculum development; scientific and other sustainability related research; outreach and multi-

stakeholder network formation promoting environmental awareness and sustainability. *Agenda 21* identifies education as critical for “motivating and involving people in building a sustainable future.”

Since 1996, the United Nations Commission on Sustainable Development<sup>8</sup> and the United Nations Educational, Scientific and Cultural Organization (UNESCO), which is responsible for implementation of Chapter 36, have promoted EFS in various official documents and conferences. In 1995, the U.S. President’s Council on Sustainable Development produced an ambitious report entitled *Education for Sustainability: An Agenda for Action*, which presents a series of initiatives and recommendations for all education based on the core themes of lifelong learning within formal and nonformal educational settings; interdisciplinary approaches; systems thinking; partnerships between educational institutions and the broader community; and multicultural perspectives. This document, the result of extensive research and collaboration among hundreds of representatives from the education, business, governmental and non-profit sectors, certainly did not change the face of education in America. Yet it remains a significant federally sponsored document on the actions and policies needed to educate American citizens regarding sustainability.

On September 4, 2002, after a protracted and difficult drafting process, the World Summit on Sustainable Development (WSSD) released its *Political Declaration* and *Plan of Implementation*. Education for sustainable development (ESD), and the crucial role of education (and educators as a stakeholder group) in assisting in the transition to a sustainable future, was not a major theme in these documents. However, the WSSD provided opportunities for stakeholders committed to education to clarify goals and further develop plans of implementation. A large Japanese delegation strongly supported the cause of education and proposed a UN Decade of Education for Sustainable Development. Nearly 300 official “Type II Partnerships,” involving governmental agencies, nongovernmental organizations, and corporations, were announced. Many of these are directly or indirectly committed to enhancing education for sustainable development.

The UN Decade of Education for Sustainable Development, to begin in 2005, presents another opportunity for educators at all levels and in all disciplines to consider the fundamental role of their work in building a sustainable future. Without the serious engagement of the education community, it is difficult to see how humanity will solve the complex global challenges we face.

### **WHAT DOES SUSTAINABILITY IN EDUCATION MEAN?**

Strong local communities that sincerely acknowledge the foundational importance of education to their longevity and vitality are the best environments for excellence in education. To be most effective and relevant, education cannot isolate learners from the context of the larger world in which they must ultimately function. Sustainability can be used as an integrating force in education to improve and facilitate academic and community

relationships. If sustainability and its foundation in scientific, environmental, technological, socio-economic and ethical learning is to become a paradigm for analysis, decision-making, planning, and action, it is essential that it be incorporated into the curriculum and instructional practices at all levels of schooling, which in turn can strongly influence programs for community education.

Newly-trained graduates should possess:

- *the knowledge to comprehend linkages among all living things, and their dependency on each other as well as the physical environment;*
- *the understanding for basic principles that govern natural systems and the ability to apply this knowledge to the limits to, and major factors associated with, Earth's capacity to sustain life;*
- *the ability to cross the boundaries of very diverse disciplines, including the understanding for cultural, economic, and political forces -- both past and present -- that affect attitudes and decision-making about natural environments based upon science and technology understanding;*
- *the skills to better understand connections between science/technology and the natural/cultural environments;*
- *the talent for seeing "the big picture" in employing scientific method and technology as organizing tools to enhance a community's capacity for using local assets to build sustainable communities;*
- *the competence to think at a level where one can integrate scientific knowledge, economic & political realities, historical & cultural experiences, and moral, philosophical, & aesthetic values;*
- *the skills to engage in scientifically, socially, and culturally informed dialogue on environmental issues in communities in which the professional works and lives;*
- *the respect for the "public way of knowing" as well as the "expert way of knowing"; and*
- *the understanding for how people organize as family, community, etc., and how activities used to meet needs affect societal health, environment, and quality of life for present & future generations.*

(Annenberg Rural Challenge, 1998 – The Rural Challenge News, Winter 1998, Randolph, VT).

### **Building Upon the Foundation of Environmental Education**

“The student who can begin early in life to think of things as connected, even if he revises his view with every succeeding year, has begun the life of learning” (Mark Van Doren, 1943). Although written almost 60 years ago, these words are as relevant in today’s world as they were in the 1940s. Environmental education for example, has more than a quarter century history as an identifiable field, but there is consistently a lack of cross-disciplinary research, information dissemination, and policy development that goes into the “connected” challenges of environmental management and public decision-making today. In fact, a lack of recognition of the connectedness of things has been partially responsible for adverse environmental impacts, economic failures, social programs that do not work, and difficulties in achieving sustainable societies.

Science programs prepare students to carry out professions in “basic” research and teaching. Although some of these programs have been a basis of the present consciousness and understanding of environmental and sustainability issues among the American populace, the awareness and knowledge that will actually carry us to that sustainable future cannot be limited to the sciences. Social, economic, cultural, political, and moral components are equally important because of the de-localized nature of many issues. As more of society becomes focused on sustainability and its philosophical foundation, new dimensions are called for in education. Consider the great shifts over recent years in public attitudes about diet, exercise, fitness, preventive health, and wellness; or about pollution, global warming, and atmospheric ozone depletion. These changes are the result of public education based on new scientific understanding. Tough issues remain, however, that are going to require a new way of preparing the public at large, as well as the professional who has to deal with complex, interconnected issues and the values that underlay many of these concerns.

Schools and the instruction they provide are often highly compartmentalized. But current students live and will work in a world where information from several disciplines must be integrated. For these reasons a recent National Science Foundation Workshop entitled “Nature and Society” (June 2000 - <http://lswweb.la.asu.edu/akinzig.nsfmeet.htm>) recommended that up to 20% of teaching and research budgets be devoted to broad interdisciplinary student learning. This allocation emphasizes both the importance of interdisciplinary training as well as the need to maintain the disciplinary foundations upon which such training is built.

Education strategies are being considered now that prepare a "new" professional able to feel comfortable in a multi-disciplinary framework. Obviously, individuals cannot have all the specialized knowledge relevant to a decision in their private, work, or civic life. They must realize through the education process, however, that such information is relevant and available. Such an approach would enable graduates to apply their learning to the needs of real world problems and real people. Cross-disciplinary education enlarges the students' awareness of issues and methods beyond their own disciplinary enquiry, enabling them to explore the interrelations of these issues and methods, and encouraging students to regard their own studies in a broader social and ecological perspective that includes the values that people possess.

## **HIGHER EDUCATION FOR A SUSTAINABLE AND SECURE FUTURE**

In the next 20 to 40 years, society must adopt new strategies that allow the needs of an expanding population to be met in an environmentally sustainable and equitable manner. Higher education will play a critical role in determining whether we succeed or fail.<sup>9</sup>

In the U.S., higher education for sustainable development (HESD) has been given impetus over the years primarily by a small number of champions from academia, nongovernmental organizations (NGOs) and business communities, and to a minor

degree from government. In other countries (notably European, but in some developing countries as well) sustainability in higher education is supported by governments and has made deeper inroads in the disciplines and professions. Some colleges and universities in the U.S. are actively pursuing an authentic commitment to sustainability, yet there is little consensus as to what the end goal looks like. Sustainable development, when deeply embraced by higher education institutions, means essentially that these values are reflected in each of the core areas of university life: research, teaching, outreach and operations.

While teaching and scholarship are beginning to incorporate these issues, so that students learn how to think in a more integrative fashion, there is a growing movement to encourage institutions to also model sustainable practices. It is critical that academics keep experimenting with, and sharing, their efforts to embody sustainability, especially in making it a focus of their disciplines and professions. It is equally necessary that major stakeholders, such as the business community and funders (foundations and governments) support sustainability in higher education.

### **Higher Education for Sustainable Development in the 1990's**

The 1992 Earth Summit (UN Conference on Environment and Development) in Rio de Janeiro elevated and reinvigorated the international dialogue on the meaning of sustainable development for higher education (see Overview). The decade between the Earth Summit and the 2002 World Summit on Sustainable Development in Johannesburg saw numerous international conferences and declarations focused on this issue. In the U.S., several publications and conferences in the mid-1990s also addressed the need for higher education to take the challenge of sustainability seriously. (See Table 1 for a chronology of related events and official declarations.)

**Table 1: Significant Events and Declarations in Higher Education for Sustainable Development**

YEAR	EVENT/DECLARATION
1972	Stockholm Declaration on the Human Environment <a href="http://www.unep.org/Documents/Default.asp?DocumentID=97">www.unep.org/Documents/Default.asp?DocumentID=97</a>
1977	Tbilisi Declaration, Intergovernmental Conference on Environmental Education <a href="http://www.gdrc.org/uem/ee/tbilisi.html">www.gdrc.org/uem/ee/tbilisi.html</a>
1989	National Wildlife Federation's Campus Ecology Program founded (formerly known as Cool It) <a href="http://www.nwf.org/campusecology/index.cfm">www.nwf.org/campusecology/index.cfm</a>
1990	Talloires Declaration, Presidents Conference, France <a href="http://www.ulsf.org/programs_talloires.html">www.ulsf.org/programs_talloires.html</a>
1990	National Council for Science and the Environment (NCSE) founded (originally the Committee for the National Institute for the Environment (CNIE) <a href="http://www.ncseonline.org">www.ncseonline.org</a>
1991	Halifax Declaration, Conference on University Action for Sustainable Development, Canada

	<a href="http://iisd.ca/educate/declarat/halifax.htm">http://iisd.ca/educate/declarat/halifax.htm</a>
1991	Management Institute for Environment and Business founded (now the World Resources Institute's Sustainable Enterprise Program) <a href="http://www.wri.org/wri/meb/">www.wri.org/wri/meb/</a>
1992	Report of the United Nations Conference on Environment and Development (Agenda 21); Chapter 36: Promoting Education, Public Awareness and Training <a href="http://www.un.org/esa/sustdev/agenda21chapter36.htm">www.un.org/esa/sustdev/agenda21chapter36.htm</a>
1992	Association of University Leaders for a Sustainable Future founded <a href="http://www.ulsf.org">www.ulsf.org</a>
1993	Kyoto Declaration, Ninth International Association of Universities Round Table, Japan <a href="http://iisd1.iisd.ca/educate/declarat/kyoto.htm">http://iisd1.iisd.ca/educate/declarat/kyoto.htm</a>
1993	Swansea Declaration, Association of Commonwealth Universities' Fifteenth Quinquennial Conference, Wales <a href="http://iisd1.iisd.ca/educate/declarat/swansea.htm">http://iisd1.iisd.ca/educate/declarat/swansea.htm</a>
1993	Copernicus University Charter, Conference of European Rectors (CRE) <a href="http://www.copernicus-campus.org/">www.copernicus-campus.org/</a>
1993	Second Nature founded <a href="http://www.secondnature.org/">www.secondnature.org/</a>
1994	Yale University Campus Earth Summit (Report: Blueprint for a Green Campus) <a href="http://www.princeton.edu/~rcurtis/earthsum.html">www.princeton.edu/~rcurtis/earthsum.html</a>
1995	Workshop on the Principles of Sustainability in Higher Education, Massachusetts (Essex Report), ULSF, Second Nature, and the President's Council on Sustainable Development
1996	The International Work Programme on Education, Public Awareness and Training for Sustainability adopted by the UN Commission on Sustainable Development <a href="http://www.un.org/esa/sustdev/edu.htm">www.un.org/esa/sustdev/edu.htm</a>
1996	Ball State University (Indiana) Greening of the Campus conferences (also 1997, 1999 and 2001) <a href="http://www.bsu.edu/provost/ceres/greening">www.bsu.edu/provost/ceres/greening</a>
1997	Thessaloniki Declaration, International Conference on Environment and Society - Education and Public Awareness for Sustainability <a href="http://www.mio-ecsde.org/Thess/TOCThess.htm">www.mio-ecsde.org/Thess/TOCThess.htm</a>
1998	World Conference on Higher Education, Paris <a href="http://www.unesco.org/education/educprog/wche/eng.htm">www.unesco.org/education/educprog/wche/eng.htm</a>
1999	World Conference on Science, Budapest <a href="http://www.unesco.org/science/wcs/">www.unesco.org/science/wcs/</a>
2001	Lüneburg Declaration on Higher Education for Sustainable Development, Germany <a href="http://www.lueneburg-declaration.de/downloads/declaration.htm">www.lueneburg-declaration.de/downloads/declaration.htm</a>
2002	World Education Forum (Education for All), Dakar <a href="http://www2.unesco.org/wef/en-conf/index.shtm">www2.unesco.org/wef/en-conf/index.shtm</a>

2002	World Summit on Sustainable Development, South Africa (Type I outcome: Decade of Education for Sustainable Development) <a href="http://www.johannesburgsummit.org/">www.johannesburgsummit.org/</a>
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Throughout the 1990's, university representatives convened several conferences around the world and produced a series of internationally recognized declarations focused on HESD and calling their institutions to action. Of the six major declarations that emerged, the Talloires Declaration (1990) has been popular in the U.S. Collectively, these documents emphasize promoting sustainability in all relevant academic disciplines; research on sustainable development issues; the 'greening' of university operations; engaging in inter-university cooperation; forming partnerships with government, NGOs and industry; and most consistently, the moral obligation of higher education to work for a sustainable future. All of the priorities in Chapter 36 of *Agenda 21* are reaffirmed in these declarations.<sup>10</sup>

Two conferences in the U.S. in the mid-1990s helped set a tone for responding to the challenge of sustainability in higher education. Each produced a report that further clarified the movement's direction for a small but enthusiastic following.

In February 1994, Yale University hosted a national conference, the Campus Earth Summit, which attracted over 400 faculty, staff and student participants from 22 countries and all 50 U.S. states. The resulting document, *Blueprint for a Green Campus*, set a standard for how to think about greening the campus in America. *Blueprint* recommends incorporating environmental learning into all relevant disciplines; making the campus a model of environmental behavior through waste reduction, energy efficiency and sustainable design; instituting environmentally responsible purchasing policies; and supporting students seeking environmentally responsible careers.<sup>11</sup> The emphases on purchasing and careers, in particular, recognized the importance of working with external stakeholders, whether as suppliers of sustainable products for the institution or as environmental leaders and alumni from business, government, media and other sectors.

In 1995, a "Workshop on the Principles of Sustainability in Higher Education" was held in Essex, Massachusetts. The resulting *Essex Report* provides a succinct and comprehensive U.S.-based expression of what fully implementing Chapter 36 of *Agenda 21* for higher education would mean. It emphasizes the importance of new pedagogical approaches, including systems thinking; exposure to issues of equity and justice; and optimal strategies such as interdisciplinary learning and hands-on activities. It also discusses strategies for change, which include actions by universities, and more significantly, actions by stakeholders in higher education.<sup>12</sup> The *Essex Report* is unique in that it goes beyond *Blueprint for a Green Campus* and many of the international declarations to embrace a more comprehensive vision of sustainability in its social, economic and environmental dimensions.<sup>13</sup>

## Assessing Progress in the United States

Despite the lack of transformative progress, colleges and universities in America are increasingly adopting sustainability initiatives. Innovative curricular reform for sustainability is on the rise. More research is being devoted to sustainability in the sciences, and to a lesser extent the social sciences and humanities. Some colleges and universities are modeling sustainable behavior through their purchasing, building design, and energy use. A few institutions have altered their mission statements to reflect the broader vision of a sustainable future. Student groups advocating campus greening and sustainability awareness have become more active recently, both on individual campuses and as national networks.<sup>14</sup> Regional university partnerships and consortia are being formed, illustrating a deeper level of commitment among and between institutions, as well as recognition that such partnerships can attract funding and affect policy.

A notable new development in science called “sustainability science and engineering” was catalyzed by the 2000 report by the National Academy of Sciences, *Our Common Journey*. In seeking “to understand the fundamental character of interactions between nature and society,” the field is called upon to investigate the vast range of issues that sustainability encompasses, to do so with urgency if a crisis demands it, and to reconsider the usefulness of knowledge for both science and society. This is an action-oriented science for which a topic like climate change simultaneously demands scientific exploration and practical application.<sup>15</sup>

Numerous scholars are engaged in transforming their disciplines at both the national and local (campus) levels. Members of various professional associations have started interest groups, divisions, or sections focused on the environment and sustainability. For example, the American Institute of Architects has a Committee on the Environment and provides an environmental education program for teachers called “Learning by Design.” The American Society for Engineering Education and the American Association of Engineering Societies jointly sponsor an Engineers Forum for Sustainable Development, which was founded in 1997. The American Planning Association and the American Management Association both have formed special interest groups. The American Academy of Religion has an ecology and religion section. Professional journals are emerging, such as *Ecological Economics* and the *Journal of Interdisciplinary Studies in Literature and Environment*. The academic community has seen a rise in peer-reviewed publications focused specifically on sustainability in higher education or sustainability more generally: the *International Journal of Sustainability in Higher Education* (Emerald) was launched in 2000, and *Environment and Sustainable Development* (Inderscience) in 2002.

When it comes to government support for environmental and sustainability education, the situation in the United States is unimpressive. There are no federal programs identified as education for sustainability. The largest targeted single source of funding and support for environmental education comes through the U.S. Environmental Protection Agency’s (EPA) Office of Environmental Education. Only a small share of this money is directed

towards higher education. A recent government report affirms that over the past several years “Congress has appropriated less than \$8 million to support OEE’s programs, which in turn support programs at the international, national, state and local levels.” The report also notes that funding for environmental education at the state and local levels is at best inconsistent. Most of this is confirmed by a 2000 Report to Congress on the status of U.S. environmental education by the National Environmental Education Advisory Council (NEEAC), a consultative body that provides advice to EPA on implementation of the National Environmental Education Act (1990). The 2000 report states that “the overall national environmental education effort remains far weaker than it should be in terms of adequate funding, coordination and leveraging of resources, and serious evaluation and assessment tools.”<sup>16</sup> Furthermore, “environmental education has not been effectively infused into the educational reform movement, nor has it been institutionalized throughout K-12 or higher education. Thus, environmental education has not achieved the desired impact in government and business, or in communities.”<sup>17</sup> The U.S. Department of Education lacks programs directed towards environmental or sustainability education.

The National Science Foundation (NSF), despite not having an identifiable program for environmental or sustainability education, estimates that it provides over \$60 million annually for environmental education projects through its Directorate for Education and Human Resources. A 2000 report from the National Science Board, *Science and Engineering for the 21<sup>st</sup> Century: the role of the National Science Foundation*, directed that environment be a priority for NSF, including funding for environmental education. In January 2003, NSF’s Advisory Committee on Environmental Research and Education, produced a 10-year outlook for the Foundation, entitled, *Complex Environmental Systems: synthesis for earth, life and society in the 21<sup>st</sup> century*. This report provides co-equal emphasis to building capacity to address environmental research challenges and to environmental research. Environmental education is a significant component of capacity building. NSF investments are expected to rise significantly, including targeted programs for environmental education within the current decade.

Exceptions to meager support for environmental and sustainability related initiatives include two prominent campus greening efforts in the early 1990s and more recent initiatives in Massachusetts and Michigan. EPA gave initial funding to Tufts University and The George Washington University (GW) in 1990 and 1994 respectively. These initiatives met with varying success, and support for the GW initiative was short-lived due to changing priorities at EPA. In 2000, EPA and the Massachusetts Executive Office of Environmental Affairs (EOEA) provided \$65,000 to conduct an assessment of the four (non-medical school) University of Massachusetts campuses to ascertain the level of education for sustainability activities and to develop plans to foster such programs. The EOEA refunded this project in 2001 to further the implementation of sustainability programs. To date, the chancellors at every UMass campus have been persuaded to appoint and charge official campus sustainability committees. Also in 2000, EPA awarded Michigan State University (one of the largest single campuses in the U.S.) \$250,000 to develop a campus sustainability program.<sup>18</sup> Western Michigan University has also recently received EPA funding for a campus sustainability initiative.

Since the early 1990's, four U.S. NGOs committed to promoting sustainability in higher education have helped articulate both the nature of a sustainable university and strategies for moving forward. These are the National Wildlife Federation's Campus Ecology Program, Second Nature, University Leaders for a Sustainable Future (ULSF), and World Resources Institute's Sustainable Enterprise Program. In 1996, these NGOs formed an Alliance for Sustainability through Higher Education to be a stronger voice for university reform. The Alliance played a significant role in ensuring that higher education was included in the program of the National Town Meeting for a Sustainable America in May 1999, an unprecedented gathering of over 3,000 Americans aimed to inspire a national movement toward sustainability. Following the National Town Meeting, which was co-sponsored by the President's Council on Sustainable Development (PCSD), the PCSD disbanded (as anticipated), and the energy generated there quickly dissipated. The lesson learned was that sustainability was still not a national priority. The National Council for Science and the Environment (NCSE) has recently joined with these other NGOs in providing additional stimulus to the HESD movement. Their key contributions include the annual National Conference on Science, Policy, and the Environment and the creation and sponsorship of a new Council of Environmental Deans and Directors (CEDD).

Most recently, a scholarly journal, the *International Journal of Sustainability in Higher Education (IJSHE)* (<http://www.emeraldinsight.com/ijshe.htm>) has been created as a joint initiative of American and European institutions. It is the world's only peer-reviewed periodical to address issues of sustainability in a higher education context.

## **Recommendations**

*Recommendations for Incorporation of Sustainability in Teaching and Practice:* Higher education must commit itself to steady reform in teaching, research, faculty and staff hiring and development, operations, student opportunities, outreach, and mission and structure. (See [www.ulsf.org/dernbach/recommend.htm#teach](http://www.ulsf.org/dernbach/recommend.htm#teach) for specific recommendations.)

*Strengthening Sustainability as a Major Concern of the Disciplines and Professions:* For sustainability to become a priority of the university—beyond cost savings and responding to specialized demands—it must become a priority of the specialized academic organizations that influence universities. (See [www.ulsf.org/dernbach/recommend.htm#disc](http://www.ulsf.org/dernbach/recommend.htm#disc) for specific recommendations.)

*Recommendations for External Stakeholders Such as Opinion Leaders, Alumni, Employers and Funders:* External stakeholders should pressure federal and state governments to move the education and research agenda of higher education toward a greater focus on sustainability. (See [www.ulsf.org/dernbach/recommend.htm#external](http://www.ulsf.org/dernbach/recommend.htm#external) for specific recommendations.)

## **KINDERGARTEN THROUGH TWELFTH GRADE EDUCATION**

"modified from Federico, C.M., Cloud, J.P., Byrne, J., and Wheeler, K., "Kindergarten Through Twelfth-Grade," in *Stumbling Toward Sustainability*, John C. Dernbach ed., Environmental Law Institute (2002)."

### **Introduction<sup>19</sup>**

K-12 education is a major shaper of the truths, attitudes, ethics, concepts, and behaviors of American society. By reshaping K-12 education in the US so that it systematically and effectively fosters sustainability, we will be able to make great progress towards the achievement of a sustainable world.

The US potential contribution to sustainable development is great. Our nation attracts the many of the best and brightest students in the world, who come here to develop their talents in our free, open, and opportunity-rich society. Our businesses and our government are important shapers and determiners of what happens in the world. In 1992, at the UN Conference on Environment and Development, the US, along with other nations in the world committed to an ambitious agenda for sustainable development, Agenda 21. Chapter 36, entitled "Education, Public Awareness and Training" promulgated many educational reforms and practices to help advance education for sustainability.<sup>20</sup> This document inspired some major national entities, conferences and coalitions in the United States: the President's Council on Sustainable Development, an Office of Education for Sustainability at the White House, an EPA Office of Sustainable Ecosystems and Communities. (See Table 2 for significant events and publications related to K-12.)

Although these particular programs have not been continued, communication, mobilization and educational framework development for US sustainability education continues in nongovernmental organizations and in some school districts and independent schools. There is an evolving understanding of the principles, skills, knowledge, and practices that constitute appropriate education for sustainability for K-12 students in the United States. Various independent efforts exist to teach students the ecological literacy, systems thinking, multiple perspectives, connection to place, sustainable economics, citizenship, and the creativity / visioning they will need to fashion a sustainable future.

**Table 2: A Chronology of significant events and publications relevant to K-12 Education for Sustainability for the U.S.**

YEAR	EVENT
1948	Aldo Leopold publishes the <u>Sand County Almanac</u>
1962	Rachel Carson publishes <u>Silent Spring</u>
1968	Definition of Environmental Education is published by Bill Stapp, University of Michigan
1970	First Earth Day
1971	North American Association for Environmental Education established
1975	UNESCO International Belgrade Conference

1976	Robert Hanvey publishes <u>An Attainable Global Perspective</u> , Global Perspectives in Education (predecessor to The American Forum for Global Education)
1977	UNESCO Tbilisi Intergovernmental Conference on Environmental Education
1980	First National Global Education Conference, The American Forum for Global Education and the U.S. Department of Education
1983	<u>A Nation at Risk A: The Imperative For Educational Reform</u> . The National Commission on Excellence in Education. <a href="http://www.ed.gov/pubs/NatAtRisk">www.ed.gov/pubs/NatAtRisk</a>
1987	“The Brundtland Report”, <u>Our Common Future</u> , World Commission on Environment and Development
1992	“The Earth Summit”, UN Conference on Environment and Development, Rio De Janeiro Agenda 21 produced, Chapter 36, Education for Sustainable Development
1993	President’s Council on Sustainable Development is created, Public Linkage, Dialogue and Education Task Force Established
1994	National Forum on Partnerships Supporting Education about the Environment, National Science and Technology Council
1995	Sustainability Education Center founded <a href="http://www.sustainabilityed.org">www.sustainabilityed.org</a>
1995	<u>Education for Sustainability: An Agenda for Action</u> published
1996	<u>Sustainable America: A New Consensus for Prosperity, Opportunity and a Healthy Environment for the Future</u> published
1997	President’s Council on Sustainable Development, <i>Public Linkage, Dialogue, and Education: Task Force</i> Report published <a href="http://clinton2.nara.gov/PCSD/Publications/TF_Reports/linkage-top.html">http://clinton2.nara.gov/PCSD/Publications/TF_Reports/linkage-top.html</a> (last visited March 27, 2002).
1997	Center for a Sustainable Future founded <a href="http://www.csf.concord.org">www.csf.concord.org</a>
1999	Sustainability Educator’s Network founded by the Partnership for Sustainability Education (a consortium of Sustainability Education Center, Center for a Sustainable Future and Learning for a Sustainable Future)
2000	Vermont “Sustainability” standard put in place of the Environment standard (and a new “Understanding Place” standard is added)
2002	World Summit on Sustainable Development, Johannesburg, South Africa
2002	IUCN Commission on Education and Communication Conference <a href="http://iucn.org/cec">http://iucn.org/cec</a> UNESCO Conference on Teaching and Learning for a Sustainable Future
2002	Adoption of the Draft Resolution on the “United Nations Decade of Education for Sustainable Development” at the United Nations General Assembly

While the American educational system works to develop many of the discrete skills that future problem-solvers will need to diagnose and solve our global problems, as a nation we lack the systemic understanding that explains these complex threats to sustainability.

Our educational system, moreover, is often focused on basic literacy and easily testable knowledge, which does not adequately prepare future citizens to understand current world problems and issues and to craft solutions for them. There is insufficient preparation of teachers to create experiences for students that help them engage with the rich, complex, interdisciplinary world in which they live. There is a lack of funding for the infrastructure needed to support a sustained and nation-wide implementation of an educational program that educates students for sustainability and that connects schools to real-world issues, problems, and social change efforts.

Educators are beginning to find support and guidance in teaching for sustainability in emerging real-world practices. Changes in thinking and behavior that foster sustainability are already underway in our society. Increasingly, leaders in business and government are making the connections and taking the steps that enable them to design and implement long-term approaches to foster sustainability.<sup>21</sup>

## **Recommendations**

### **Teacher Education, Pre-Service and Inservice**

Schools of education need to embrace two goals in their teacher education programs:

- Ensuring that teachers understand sustainability, and themselves are equipped with the content knowledge and skills that will help them contribute to a more sustainable world;
- Ensuring that teachers can apply this knowledge and these skills in the work they do with students.

Teachers must have the skills, insights and desire to ensure that their students are able to contribute to the ways their communities are working to advance the transition to sustainability.

A research agenda needs to develop in concert with the development of this goal, so that schools of education may develop effective means of educating teachers about sustainability and preparing them to be effective educators that enable their students to understand and foster sustainability. At this stage, research and reports are “generally descriptions of action at the level of the individual institution.”<sup>22</sup>

Some resources for the professional development of educators exist to inform this process:<sup>23</sup>

- the *Toolbox* in-service education project conducted by the National Consortium for Environmental Education and Training in the United States (EPA-funded);
- the Environmental Education Initiative in Teacher Education in Europe;
- the UNESCO Learning for a Sustainable Environment - Innovations in Teacher Education Project in the Asia-Pacific region;
- the Indian national in-service education program conducted on a "cluster - model" (and incorporating workshops delivered by satellite) by the Centre for Environmental Education in India;

- the Environmental and Development Education Project for Teacher Education in Australia and the *Teaching for a Sustainable World* modules.

### **Standards and Assessment**

While many of the content and performance standards used in US schools develop skills and capacities that make possible education for sustainability, the knowledge and skills needed to foster sustainability are usually not explicit educational goals, and certainly are not usually among the knowledge and skills assessed in US American school systems. Sustainability educators must mobilize to persuade their state education organizations to approve standards for sustainability education, and must persuade content-area groups that create standards (e.g., the National Council for the Social Studies, the National Research Council, the National Council on Economic Education) to incorporate the skills and knowledge necessary for the attainment of sustainability into the standards they develop and promulgate. Of course, this can only happen if these content area groups, which usually contain prominent expert practitioners of the subject in question, agree that a sustainability framework best explains the data analyzed in their field and best supports future work in their field. Sustainability educators must rely upon sustainability practitioners and theoreticians to advance the infusion of sustainability ideas and practices into these fields.<sup>24</sup>

A consensus is building that students need to be able to evaluate information, construct effective arguments from sources, participate effectively in public policy and democratic action, synthesize facts from various fields to construct valid models of the world informed by knowledge from several academic subjects, see patterns and deduce larger truths from smaller events, and continue to learn as they wend their way through a changing work world and society. The school experience must help students to develop these skills. Developing these skills takes time; educational priorities must change so that students spend sufficient time in school activities to develop these skills, and the other capacity-building skills that a people must have if they are to move their society towards sustainability.

State-wide assessments of student learning must change to reflect the new high priority for these goals. Certain state assessments support the above educational goals: some elementary science assessments, for example, ask students to design and carry out a scientific experiment; the New York State Regents examinations in history include a document-based question, in which students must analyze and use sources to answer a historical question. The current ascendancy of “high-stakes” testing of less complex skills often crowds out the opportunity to develop the skills future workers and citizens will need to tackle multifaceted problems and successfully negotiate the intertwined social and environmental situations that will arise in the lives of all 21<sup>st</sup>-century citizens. Assessments in K-12 education often function as “the tail wagging the dog;” education for sustainability will be enhanced if that tail-wagging supports the understandings and skills needed to foster sustainability. There is a growing number of organizations and associations working to reform assessment;<sup>25</sup> sustainability educators need to find and

support appropriate allies in this movement and to support right-minded efforts in this area.

A change in the skills and knowledge that colleges expect from entering students also could help advance K-12 education for sustainability. Independent schools often do not focus on or even offer standardized tests, yet many of these schools feel that college entrance requirements leave them as constrained as their public school counterparts in the education they can offer their students. As college entrance requirements align themselves more with the learning outcomes of sustainability education, more K-12 schools will be able to focus on developing the skills and knowledge that foster sustainability in their students.

### **Community Education, School Partnerships, and Real-World Knowledge**

Much work needs to be done to connect students with real-life, existing, on-the-ground work that is ongoing in their community to foster sustainability (see next section). How better to help students understand sustainability than to ask them to learn from people trying to create it? Students can critically analyze the physical plant of their schools and the state of their communities, and work with others to make real improvements in these areas.<sup>26</sup> This would necessarily involve the work of community members and organizations—NGO's, architects, engineers, businesspeople, gardeners, farmers, etc. Outreach, support, and training must exist to help these people and groups effectively work with schools and students.

Community education is crucially important in that education is notoriously conservative, often reflecting status-quo values and understandings rather than preparing students for the new, different world they will inhabit when they graduate. Communities educated *about* sustainability will support educating their children *for* sustainability; these education efforts can be part of overall efforts to revitalize American civic life and counter civic apathy. K-12 educators, therefore, have a vested interest in either doing community education themselves or supporting the efforts of community educators who develop the capacity of parents and citizens to understand and practice sustainability and to understand the need to educate children so that they can create a more sustainable world. The Center for Geography and Environmental Education has an excellent resource for community education, the *ESD Toolkit*;<sup>27</sup> the Sustainability Education Center has an online training in *Ecological Economics for Life*;<sup>28</sup> the Northwest Earth Institute<sup>29</sup> produces, in print, a series of community discussion courses on sustainability-related topics; YES! Magazine covers a broad array of sustainability-related issues for the general public.<sup>30</sup> Funding should be sought to bring this material to American communities.

### **Curriculum Development and Distribution**

While many first-rate units exist that educate for sustainability, and some entire courses have been developed and are in development, many more need to be created. More importantly, resources and time must be dedicated to market, diffuse, and distribute these

units, and to help teachers use them effectively in their classrooms. Funding the creation of a curriculum unit is never easy, but funding its national distribution and dissemination is currently nearly impossible. Sustainability educators need to convince school districts and funders of the indispensability of funding to support the widespread and effective use of curriculum units that educate students for sustainability.

## **Funding**

Sustainability educators in the US are still in the position of establishing the need and utility of their approach and educational goals. We stand, therefore, in need of public and private funding to support this effort, which must include the production of policy reports, the lobbying of educational organizations, the gathering of research data to demonstrate the efficacy and outcomes of sustainability education curricula and programs, the involvement of teachers and students in the creation of sustainability, and the time and labor-intensive networking efforts needed to work out effective strategic partnerships between sustainability educators and individual districts, schools, and teachers. Support for the further development and dissemination of sustainability education through journals, conferences, symposia with sustainability practitioners, and contact with developers of sustainability thought would also enhance the success of efforts to educate US students for sustainability.

## **Conclusion**

Groundwork for sustainability education has been laid in the 10 years following the UN Conference on Environment and Development. Some recent changes in educational practices help to prepare youth to understand and implement sustainable development (service learning, a focus on competencies and skills, standards that support interdisciplinary understanding and complex thinking, growing recognition of the importance of “systems thinking,”) Several organizations, and a network for those organizations, now exist that attempt explicitly and effectively to bring the diverse and emerging understandings of what sustainability looks like, in its multi-faceted aspects, to our young people, and to define and develop skills and dispositions in youth that will enable them to create a more sustainable world as future workers and as active citizens. However, like our counterparts in business, design, architecture, and agriculture, our endeavor is still in the chrysalis stage. All of those interested in fostering sustainability still must work to provide the American people with the opportunity to examine current practices with respect to their impact on the ability of all people, now and into the future, to have fulfilling, secure lives—and to consider whether the needed changes can produce *more* options, *more* fulfillment, and more fun.

## **COMMUNITY EDUCATION**

This section reviews progress that has been made over the last decade with regard to community education in the area of sustainable development. Governmental agencies and non-profit groups have found it effective to involve communities in dialogue that leads to eventual decision-making as it applies to environmental management and protection. In reaching out to the public on environmental issues, there have been a number of recommendations made and tools identified in recent years that can be implemented to assist public groups in achieving more effective interaction, awareness, and action taking.

But at the same time, we are faced with the notion of providing communication and learning opportunities to the public that will better inform their understanding and decision-making with regards to the connections among issues, reaching across disciplines such as economics and environment. Likewise, it is important that communities be able to compare their values to the growing awareness that is being developed in the public arena concerning an ethic of sustainability and what society is considering as its legacy for future generations.

### **Progress in Environmental Education at the Community Level**

Tools and methodologies have been developed and refined in recent years to enhance community awareness and understanding for environmental problems and solutions. For example, the model termed community-based environmental education (CBEE) differs from traditional education in that the educational activities not only build individual knowledge and skills, but also help to build an infrastructure for change that is sustainable, equitable, and empowering. The intent of the community-based environmental education model is to build the skills of citizens to gather, analyze, and apply information for the purpose of making environmental management decisions (A Model of Community-Based Environmental Education, 2002, Andrews, E., M. Stevens, and G. Wise. In: *New Tools for Environmental Protection: Education, Information, and Voluntary Measures*, pg. 161-182. The National Academy of Sciences -- <http://www.nap.edu/openbook/0309084229/html/161.html>).

Community-based environmental education incorporates public participation, social marketing, environmental education, and right-to-know strategies. The community-based model, however, contrasts with Ramsey's definition of environmental education in that those community-based environmental education goals incorporate a behavior change or policy change objective that reaches beyond just the idea of awareness and understanding. Effective community-based environmental education builds on community development processes (including problem-solving, community-building, and systems interaction) and focuses on generating positive actions, rather than criticism or protest of current policies. In a community-based education model, a community:

- has or establishes a vision and goals;

- inspires an instigator who, stimulated by these goals, enlists or gathers a group or coalition to start an initiative and to keep it going;
- supports group activities to gather and analyze information; and
- engages the larger community in carrying out what it has learned through policy changes, new regulations, and/or education.

Each of these actions, viewed separately, can be seen as similar to a great deal of everyday community activity. What is distinctive about the CBEE model is that it integrates the elements as a linked chain.

But, community-based education means more than "education based in the community." It implies an education plan created as a result of community involvement and designed to match community interests. "Community interests" refer to standard community issues, such as affordable housing or workforce development, as well as to activities with a recognizable environmental component such as road building, stormwater management, "permitting" a new development, or addressing environmental health concerns in an urban neighborhood. Ideally, the education plan helps strengthen citizens' skills to plan or act with the environment in mind. Goals of community-based environmental education therefore include:

- expanding the community's ability to improve environmental quality;
- integrating environmental management goals with other community development activities;
- leading to actual environmental improvement; and
- increased involvement of more community interests in community-based environmental management activities.

There is a rich set of resources about what makes community-based involvement and outreach effective. But a common theme is a consistent emphasis on application of community development techniques to solving community problems. The question of when to use the CBEE model refers to the type of decisions needed. If individual behaviors are the primary management elements, then application of CBEE can provide peer support and motivation. But if transfer of relevant information is the only goal, CBEE is only one of many workable approaches. If a policy or infrastructure change is needed, then application of CBEE is one of a few ways to accomplish the goal sustainably.

CBEE activities have four key qualities. Activities are community based, collaborative, information based, and action oriented. Applying a community-based approach is both an art and a science. The art is in the educator's ability to notice and take advantage of community links and opportunities. The science involves applying skills needed for working with a coalition or group.

The means to effect change in communities has traditionally pitted advocacy groups, elected leaders, and influential citizens against one another. Leaders usually focus on bringing together groups of like-minded people or special interest coalitions to overpower others. When this strategy works it leaves people divided. When it does not work it

leaves gridlock. Both function to alienate people from the process of further involvement. CBEE could be described as a process of changing the community's idea of acceptable environmental management behavior, as a result of direct involvement of citizens in the management process through collaborative techniques that build upon their collective wisdom. In this way, community interests work together to find and implement solutions to common problems. The role of education seems clear. At a minimum, it is important to help people develop the capacity to make decisions and take responsibility.

In dealing with sustainable solutions to problems faced by a community of people, it is unbelievable how much the people that live and work in that community really know. Without many people looking at a problem and bringing their different viewpoints to bear on it, errors remain uncorrected, narrow perspectives and selfish motives are rewarded, and the general welfare will not usually be promoted. For that to happen, the concept of sustainable development must be articulated in terms familiar to community/business leaders as well as individual citizens. The challenge lies in looking for solutions about how institutions could work more efficiently, more collaboratively, more respectful of the public way of gaining knowledge in any particular place or culture.

By being information based, CBEE integrates the dissemination of facts with traditional education, participatory decision-making, and other tools used in communication/diffusion approaches. CBEE exemplifies the ideal application of learning theory, which maintains that individuals are not motivated to learn unless the information is relevant to their lives and they have a sense of control about the learning process.

Knowledge is not only transferred to the individual, but is instrumental in transforming the individual. For education to take place, the individual has to actively receive the knowledge and know what to do with it in an action-oriented fashion. An education program, if it is going to accomplish transformation, or even if it is merely to result in the adoption of a target behavior, must include communication, skill development, and application.

A community awareness and education program based upon the CBEE model relies primarily, on informal learning – learning through activities that occur outside formal educational settings and that are characterized as voluntary. Just as in formal education, however, informal learning experiences can be structured to meet a stated set of objectives and can be designed to influence attitudes, convey information, and/or change behavior. Our challenge is to figure out how to use communication, diffusion, and education strategies to infuse environmental management considerations into the mix of everyday discussion and decision making.

When educators, business/industry administrators, politicians, or government agency representatives suggest public education as one way to meet an environmental management goal, the education strategy must go beyond simplistic solutions to be effective. The usual suggestions – hold a meeting, write a manual, develop a curriculum, provide training – will not support long-term or structural change on their own. Coupling these standard education resources with the CBEE process sets the stage for meaningful

education; that is, education designed to provide the context and relevance recognized by the learner and to generate the opportunity for the learner to apply knowledge to the environmental problem. If CBEE's participatory processes are complemented by an authentic commitment to participate in and use its key qualities of being community based, collaborative, information based, and action oriented, we can achieve community flexibility and more effective responsiveness to environmental issues.

An important avenue to implementing community sustainability also comes from the conduct of research by and on behalf of the community. This can involve what has now become known as "citizen science," which aims to engage the expert way of knowing (scientists) with the public way of knowing (stakeholders) in an ongoing dialogue with environmental managers about the kinds of ecosystems people want and the kinds of ecosystems people can in reality get. Community-based research processes involving citizen science, unlike mainstream scientific and technical research, are very valuable to community groups that are eager to know the research results and to use them in practical efforts to achieve constructive social change.

A good example of this process comes from looking at an event that took place in Africa over the last 10 years. An African village began cultivating timber bamboo for building construction. They planted this in places where the rich soil needed for a farm had been eroding away. By harvesting the bamboo at maturity, which was planted three years earlier, the community constructed its buildings and shelter, using a material that is readily renewable. The community has grown economically and materially without any deleterious effect to the environment. Planting timber bamboo to prevent soil erosion, while using this renewable resource for building materials, was a perfect community-based research approach to achieving sustainable development.

It is within the context of this iterative process of social change, allied with the application of scientific knowledge, guided by moral, spiritual principles, that truly sustainable models of production and habitation can emerge. In other words, the advancement of a new set of values for nature and the unfolding of a global order that can effectively address environment and development issues, both depend on the enhancement of the only infinite resource in the face of depleting material resources -- human spiritual potential.

Because sustainable development honors the integrity of both society's experience and its environment, the outcome of people interacting with people is a unified world view in which a system's function defines the system. Experiential transfer among people is thus critical to understanding how ecosystems and their interconnected, interactive components function, including the bridge between a community and its surrounding environment. And then we discover another way, one that increasing numbers of people are considering. It is an avenue of "enough," a pathway for the good life determined by what we do and how we relate to others, not by how much money we make or how much stuff we own.

## Recommendations

The PCSD's Education for Sustainability: An Agenda for Action (1995) makes the following policy recommendations for non-formal education<sup>31</sup>:

"Expand public access to opportunities to learn about sustainability issues as they relate to the private, work, and community lives of individuals.

**Public Awareness:** Support a campaign to raise public awareness of sustainability, convey information on indicators of sustainable development, and encourage individuals to adopt sustainable practices in their daily lives.

**Sustainable Development Extension Network:** Establish an extension network to enhance the capacity of individuals, workforces, and communities to live sustainably.

**Workforce Development:** Infuse sustainability concepts and practices into development of the U.S. workforce.

**Lifelong Learning:** Encourage lifelong learning about sustainability at the individual, household, and community levels."

The following recommendations are from The President's Council on Sustainable Development Report, *Sustainable America: A New Consensus* (1996) that highlighted the need for better information and new educational approaches for strengthening communities in their efforts to become sustainable. Sustainable development requires that communities have the ability to compile and link disparate sets of data to create the information bases needed for effective decision making. In this regard, it is crucial that the mass media be knowledgeable about sustainability and able to translate it into a language that everyone can easily understand.

Information and Education: Building knowledge of the interdependence among economic prosperity, environmental protection, and social equity will help citizens understand, communicate, and participate in the decisions that affect their lives.

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- Policy Recommendation #1: Managing Information for Sustainable Development.  
Improve the collection, organization, and dissemination of information to reduce duplication and streamline reporting requirements while giving decision makers information related to economic, environmental, and equity goals.
  - Policy Recommendation #2: Strengthening Science Information.  
Strengthen the base of scientific knowledge and increase its use by decision makers and the general public.

- **Policy Recommendation #3: Expanding Access to Information.**  
Adopt open information policies and practices, recognizing that disclosure and active dissemination of information should be the rule, not the exception. Adopt policies that increase access to public information for all segments of society and encourage the development of the National Information Infrastructure by the private sector in ways that improve access to all.
- **Policy Recommendation #4: Information for Sustainable Living.**  
Endorse and promote awareness of the economic, environmental, and social benefits of sustainable practices – such as more efficient resource use in government, the private sector, and the home – and encourage local governments, businesses, and community groups to engage people in making these improvements.
- **Policy Recommendation #5: Measuring Progress Toward National Goals.**  
Develop indicators of progress toward national sustainable development goals and regularly report on these indicators to the public.
- **Policy Recommendation #9: Opportunities for Learning Outside the Classroom.**  
Encourage non-formal access to information on, and opportunities to learn and make informed decisions about, sustainability as it relates to citizens' personal, work, and community lives.
- **Policy Recommendation #10: Strengthening Formal and Non-formal Education.**  
Institute policy changes to encourage equitable opportunities for education on sustainability at all levels; develop, use, and expand access to information technologies in all educational settings; and encourage understanding about how local issues fit into state, national, and international contexts.

Strengthening Communities: While the challenges facing the nation are difficult to resolve at any level of government, local communities offer people the greatest opportunity to meet face to face to fashion a shared commitment to a sustainable future.

- **Policy Recommendation #1: Building a Community Together.**  
Create a community-driven, strategic planning process that brings people together to identify key issues, develop a vision, set goals and benchmarks, and determine actions to improve their community.
- **Policy Recommendation #3: Promoting Economic Development and Jobs.**  
The communities that prosper will be those that develop strategies to create resilient local economies that make the unique strengths of their people and their place a source of competitive advantage.

- Policy Recommendation #7: Training and Life-Long Learning.  
Expand and coordinate public and private training programs to enable all people to improve their skills to match future job requirements in communities on a continuing basis.

## **EDUCATION FOR BUSINESS SUSTAINABILITY**

The private sector approaches the issue of sustainability with confusion over:

- 1) the meaning of sustainability for business and the company
- 2) the appropriate scope of responsibility
- 3) how and where to incorporate sustainability
- 4) where is the value in moving towards this goal.

Corporate action related to sustainability has been hindered by the need for answers to these questions.

A survey of leading multi-nationals conducted by Sustainable Value Partners highlighted the following challenges with respect to corporate responsibility and sustainable development.

- 1) Sustainable development is in rapid transition with:
  - a) more emphasis on value creation, not only risk management;
  - b) greater integration into the business;
  - c) broader and deeper stakeholder dialogue;
  - d) less development of social activities than environmental ones.
- 2) Line management and finance have not bought into the concept.
- 3) Value capture is a critical issue and is linked to greater line management and CFO involvement.
- 4) Lack of a compelling business case is the #1 obstacle to greater adoption of environmental and social performance beyond compliance with the regulations.

Polarization of the environmental and business communities and lack of association between the scientific and business communities has made communication between those with the answers and those seeking the answers increasingly more difficult. Moreover, even within business there is often a gap in understanding and language between those with environmental and social expertise and those with core business and financial responsibility. Educational programs and institutions can provide a forum to address the needs of corporations as they move towards sustainable practices.

At the 2002 World Summit on Sustainable Development in Johannesburg, the environment was linked to economics, exemplifying the need for corporate action on sustainability. Tied to the discussion of sustainability is the issue of corporate social responsibility. Innovative businesses have taken the initiative to incorporate sustainable practices in their decision-making. Leaders in corporate social responsibility, such as BP,

3M, and DuPont have demonstrated the benefits of sustainable practices. As companies move forward, several issues must be addressed:

- “Creating a level playing field” – There exists a business conflict between those who are happy with the status quo and innovators who look to the future.
- “Sustainability Ethic” – A foundation of integrity and values must exist and remain deeply integrated in a company’s value/incentive system.
- “Sustainable Livelihoods” – Without jobs or job creation, a company cannot create opportunities for advancement in other areas.

The World Business Council on Sustainable Development, a coalition of 160 international companies formed in January 1995, is playing a leading role in shaping business’s response to the challenges of sustainable development, united by a shared commitment to sustainable development via economic growth, ecological balance and social progress. Brad Allenby, a leader in the field of Industrial Ecology, has produced a volume of information ([www.greenbiz.com](http://www.greenbiz.com)) ([www.att.com/ehs/ind\\_ecology/articles/](http://www.att.com/ehs/ind_ecology/articles/)), which has expanded the discussion of the responsibilities of corporations in the context of sustainability.

Education for Leadership is a concept to provide business executives with the knowledge necessary for informed decision-making on sustainability issues. The goal is to provide the next generation of MBA graduates with the information necessary to understand the importance of sustainability, think innovatively about how to achieve this standard, and implement sustainable management practices. Rick Bunch at the World Resources Institute ([www.wri.org/](http://www.wri.org/)) has authored several papers addressing the need to move business schools toward sustainability. Additionally, the WRI issues a biennial report “Beyond Grey Pinstripes” ([www.beyondgreypinstripes.org/](http://www.beyondgreypinstripes.org/)) highlights MBA programs that incorporate environmental and sustainable management practices. The University of North Carolina Kenan-Flagler Business School ([www.kenan-flagler.unc.edu/](http://www.kenan-flagler.unc.edu/)) is recognized as one of the leading MBA programs providing sustainability education for business leaders.

Sustainability in higher education should not be restricted to MBA programs. Incorporating sustainability in trade schools and community colleges must occur as well. The question of ‘how to do this’ requires an answer.

The educational process is a two-way street. Because incentives drive outcomes, it is critical for the business community to educate the environmental community to identify and tie a corporation’s incentives to sustainable practices in order to bolster the case for a shift towards sustainability. Business can take a leading role in educating the entire community about sustainability and their efforts to become sustainable. Presentations to community groups such as schools, civic associations, and service organizations can lead the effort to instill more sustainable behaviors throughout the community. Inviting the community to events such as an open house can provide the company with an opportunity

to demonstrate the extensive steps that quality companies take to eliminate harm to people and the environment. Supporting projects such as restoring habitats for wildlife and sponsoring contests that encourage citizens of all ages to practice sustainability are ways in which business can be a positive example for their community.

The challenge to community leaders is to work together to answer the major topics identified. Only when those with the power to effect change have the knowledge to make informed decisions, will there be a shift towards sustainable practices.

## **GUIDE TO KEY INTERNATIONAL DEVELOPMENTS & DOCUMENTS REGARDING EDUCATION FOR SUSTAINABLE DEVELOPMENT**

Until recently, most of the international declarations on education for sustainable development (ESD) have been facilitated by the UN Educational Cultural and Scientific Organization (UNESCO), which also supported international conferences and declarations on environmental education dating back to 1972. At the 2002 World Summit on Sustainable Development (WSSD), several nongovernmental and professional associations also issued declarations in support of ESD. Over the past 10 years, the World Conservation Congress (IUCN) Commission on Education and Communication has been the most active international nongovernmental organization in convening ESD thinkers and producing publications.

This section highlights some of the major international players and primary source documents in ESD.

### **UNESCO: the “Task Manager” of ESD in Agenda 21**

At the 1992 Earth Summit, delegates adopted *Agenda 21*, an ambitious list of goals and objectives to achieve sustainability ([www.un.org/esa/sustdev/agenda21.htm](http://www.un.org/esa/sustdev/agenda21.htm)).

Chapter 32 of *Agenda 21* dealt with education and public information. UNESCO was appointed the “task manager” of this chapter and charged with developing a workplan and reporting progress to the UN Commission on Sustainable Development (CSD), which met periodically between 1992 and the World Summit on Sustainable Development (WSSD) in 2002 ([www.johannesburgsummit.org/](http://www.johannesburgsummit.org/)).

The WSSD asked UNESCO to continue its oversight of ESD. However, neither conference provided a budget adequate to the task.

The key declarations and reports by UNESCO regarding Environmental Education (EE) and ESD are listed below. Most of these documents reflect the thinking of international experts gathered at conferences to discuss and refine various issues or to state priorities.<sup>32</sup>

1975 *The Belgrade Charter*, from the Belgrade Conference on Environmental Education. Sponsored by UNESCO, this was the first international conference on EE. It followed up on the landmark United Nations Conference on the Human Environment held in Stockholm in 1972.

1977 *The Tblisi Declaration* signed at the Intergovernmental Conference on Environmental Education in Tblisi, Georgia. This UNESCO conference of leading environmental educators continued the work of the Belgrade Conference. The *Tblisi Declaration* offers a definition of EE that has been retained by environmental educators worldwide. It declares that EE must include social and economic studies as well as scientific studies and address student attitudes and behaviors toward the environment as well as their knowledge of the environment.

- 1992 Chapter 36 of *Agenda 21* contains the commitments made at the Earth Summit regarding education. This document calls on governments to reorient all education towards sustainable development
- 1997 *Declaration of Thessaloniki*. A declaration by participants of the UNESCO-sponsored international conference: *Environment and Society: Education and Public Awareness for Sustainability* in Thessaloniki Greece that urges governments to act on their commitments at the Earth Summit.
- 1998 *Toward an Agenda 21 for Higher Education*: Working document from the *World Conference on Higher Education*, Paris 1998. This UNESCO-sponsored conference brought together groups and individuals applying ESD to higher education.
- 1999 *Programme on Education, Public Awareness and Training*, The UN Commission on Sustainable Development (CSD) adopted this UNESCO-proposed workplan that includes 7 and 23 tasks to promote ESD worldwide.
- 2002 *Education for Sustainability: From Rio to Johannesburg Lessons Learnt from a Decade of Commitment*. UNESCO reports on its 10 years of efforts in ESD. It concludes that ESD is “an emerging dynamic concept that deals more with values than with science.”

### **World Conservation Union ESD Activities**

Of the major international NGOs, the World Conservation Congress (IUCN) has made the greatest effort to convene ESD experts and practitioners from around the world.

Founded in 1948, IUCN is a partnership of 980 state governments, government agencies, and nongovernmental organizations in 140 countries. Its world headquarters is in Gland Switzerland, near Geneva, and it has regional offices throughout the world.

In addition to its institutional members, the IUCN has six voluntary commissions made up of individual invited experts who elect a chair, develop a work plan, and advise IUCN. One of these is the Commission on Education and Communication (CEC) which includes several hundred education and communication experts, both academics and practitioners. This commission is organized into world regions, parallel to the IUCN regional divisions. The head of each region sits on a steering committee with a chairperson who is elected by all IUCN members.

The CEC also has topical committees, one of which is on ESD, which has sponsored the following activities:

- Hosted an international online discussion on ESD (published as ESDebate international debate on education for sustainable development)

- Published a book, *Education and Sustainability Responding to the Global Challenge* which examines the evolution of ESD and gives examples of how it is being implemented in each world region, and
- Conducted an international needs assessment of ESD teaching materials and corporate training materials and pointed out gaps.
- Organized a two-day workshop, *Engaging People in Sustainability*, at the World Summit. It drew 200 participants. The proceedings will be published in 2003.<sup>33</sup>

## **International Declarations on ESD at the World Summit on Sustainable Development**

Two grassroots declarations at the World Summit on Sustainable Development dealt with ESD:

- The *Ubuntu Declaration on Education and Science and Technology for Sustainable Development*, spearheaded by the United National University and signed by a dozen education and scientific organizations, which calls for greater global emphasis on education for sustainable development, the strengthening of science and technology education for sustainable development, and international partnerships to accomplish these goals (see [www.un.org/events/wssd/pressconf/020901conf1.htm](http://www.un.org/events/wssd/pressconf/020901conf1.htm)); and
- The *Declaration by Environmental Education Associations Supporting Education and Communication for Sustainable Development*, which was signed by 24 membership organizations, mainly professional associations of environmental educators, with representation from 73 countries (see [www.iucn.org/cec/how\\_to\\_help.cfm?id=74](http://www.iucn.org/cec/how_to_help.cfm?id=74)).

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<sup>1</sup> Most of the material for this overview section and the succeeding section on higher education is taken from Calder, W. and Clugston, R. M., "Higher Education," in *Stumbling Toward Sustainability*, John C. Dernbach ed., published by the Environmental Law Institute, 2002.

<sup>2</sup> David Orr, Director of Environmental Studies, Oberlin College, (1994) *Earth in Mind*, Island Press.

<sup>3</sup> Second Nature and University Leaders for a Sustainable Future, Workshop on the Principles of Sustainability in Higher Education, *Essex Report* (1995), 5. See also Anthony D. Cortese, *Education for Sustainability: The University as a Model of Sustainability* (1999) and *Education for Sustainability: The Need for a New Human Perspective* (1999), available at [www.secondnature.org](http://www.secondnature.org).

<sup>4</sup> Declaration of the United Nations Conference on the Human Environment, June 16, 1972.

<sup>5</sup> Sponsored by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Environment Program (UNEP), this conference marked the beginning of environmental education initiatives on an international governmental level.

<sup>6</sup> UNESCO-UNEP (1977).

<sup>7</sup> The most frequently cited definition of sustainability came from the report of the World Commission on Environment and Development (WCED), chaired by Gro Harlem Brundtland, then prime minister of Norway. Sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." WCED, *Our Common Future* (1987).

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<sup>8</sup> The CSD was created in December 1992, to ensure effective followup of UNCED and to monitor and report on implementation of the Earth Summit agreements at the local, national, regional and international levels.

<sup>9</sup> Second Nature and University Leaders for a Sustainable Future, Workshop on the Principles of Sustainability in Higher Education, *Essex Report* (1995).

<sup>10</sup> To date, over 1,000 university presidents have signed onto the three declarations written for institutional endorsement: the Talloires Declaration (managed by University Leaders for a Sustainable Future), the Kyoto Declaration on Sustainable Development (managed by the International Association of Universities), and the Copernicus University Charter for Sustainable Development (managed by COPERNICUS-CAMPUS, formerly a program of the Association of European Universities). Roughly one third of these signatory institutions are from the global south, and one-fifth from countries in the former Soviet Union and Warsaw Pact nations.

<sup>11</sup> See *Blueprint for a Green Campus: The Campus Earth Summit Initiatives for Higher Education*, A Project of the Heinz Family Foundation (1995).

<sup>12</sup> Second Nature and the Association of University Leaders for a Sustainable Future, Workshop on the Principles of Sustainability in Higher Education, *Essex Report* (1995).

<sup>13</sup> Also of note, the Nathan Cummings Foundation commissioned The Class of 2000 Report: Environmental Education, Practices and Activism on Campus in 1996.

<sup>14</sup> See especially the Student Environmental Action Coalition at [www.seac.org/](http://www.seac.org/), and SustainUS at [www.sustainus.org](http://www.sustainus.org).

<sup>15</sup> See Robert W. Kates et al., *Sustainability Science*, 292, Sci. 641 (Apr. 27, 2001). See also National Research Council, *Our Common Journey: A Transition Toward Sustainability* (1999).

<sup>16</sup> See “Report to Congress II,” National Environmental Education Advisory Council (September 28, 2000). 2; [www.epa.gov/enviroed](http://www.epa.gov/enviroed).

<sup>17</sup> *Id.*, 11.

<sup>18</sup> See ([www.msu.edu/unit/vprgs/RN%20Summer%202000/EPA%20grant.htm](http://www.msu.edu/unit/vprgs/RN%20Summer%202000/EPA%20grant.htm)). In the area of enforcement, EPA Region I has focused a portion of its efforts since the mid-1990’s on colleges and universities after discovering that environmental noncompliance (primarily unsafe storage of hazardous waste) was endemic in this sector. Recently pressure has increased and the fining of prominent institutions has made national news. As of June 2001, EPA had conducted 31 inspections at major colleges and universities. See John Voorhees, *The Changing Environmental Management Scene: Federal Policy Impacts the Private and Public Sectors*, 31 ELR 10001, 10094-95 (Jan. 2001).

<sup>19</sup> Although the text refers to American society and education, it is broadly relevant to other societies and nations).

<sup>20</sup> UN Conference on Environment and Development, Agenda 21, U.N. Doc. A/CONF.151.26 (1992), Section 36. To be referred to as “Agenda 21, Chapter 36” ff.

<sup>21</sup> There is a growing sustainable business movement: witness the Global Reporting Initiative (further information about this effort is available at the Global Reporting Initiative’s website, [www.globalreporting.org](http://www.globalreporting.org)), and the increasing number of businesses that acknowledge, through “triple bottom-line” reporting, their need to attain social, environmental success as well as financial success (SustainAbility, developers of the Triple Bottom Line, give details about it at SustainAbility, *The Triple Bottom Line*, at [www.sustainability.com/philosophy/triple-bottom/default.asp](http://www.sustainability.com/philosophy/triple-bottom/default.asp) 2. In government, states and local communities are convening multi-stakeholder groups to create and implement plans to foster sustainability locally: see the Sustainable Communities Network (further information about this organization is available at their website, [www.sustainable.org](http://www.sustainable.org)); the International Council for Local Environmental Initiatives (further information about this organization is available at their website, [www.iclei.org](http://www.iclei.org)); New Jersey’s “sustainable state” report: New Jersey Interagency Sustainability Working Group, *Governing with the Future in Mind* (Trenton, NJ: New Jersey Department of Environmental Protection, 2001), available at [www.state.nj.us/dep/dsr/governing/](http://www.state.nj.us/dep/dsr/governing/), (last revised 1/22/02); the Oregon Solutions website, <http://www.oregonsolutions.net/oregon/index.cfm>; Sustainable Seattle (further information about this organization is available at their website, [www.scn.org/sustainable/susthome.html](http://www.scn.org/sustainable/susthome.html)).

<sup>22</sup> Griffith University and the Department of the Environment, Sport & Territories, *Teaching for a Sustainable World*, Rationale, at [www.ea.gov.au/education/publications/tsw/rationale.html](http://www.ea.gov.au/education/publications/tsw/rationale.html).

<sup>23</sup> *Ibid.*

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<sup>24</sup> For example, there is an International Society for Ecological Economics ([www.ecologicaleconomics.org](http://www.ecologicaleconomics.org)); the Union of Concerned Scientists ([www.ucsusa.org](http://www.ucsusa.org)) does excellent work in advancing support for studying sustainability-related issues in science and for disseminating sustainability-related scientific conclusions to schools and the public.

<sup>25</sup> ReThinking Schools, for example (website: [www.rethinkingschools.org](http://www.rethinkingschools.org)), or the National Center for Fair & Open Testing (website: [www.fairtest.org](http://www.fairtest.org)).

<sup>26</sup> There is ongoing work in this area: in particular, the New Jersey Sustainable Schools Network, managed by Global Learning, works to implement sustainability, particularly greenhouse gas reductions, amongst its many members (website: [www.globallearningnj.org/SSN.htm](http://www.globallearningnj.org/SSN.htm));

<sup>27</sup> Rosalyn McKeown, *ESD Toolkit*, (Knoxville, TN: Center for Geography and Environmental Education, 2000), available at [www.esdtoolkit.org](http://www.esdtoolkit.org).

<sup>28</sup> Sustainability Education Center, *Ecological Economics for Life*, at [www.sustainabilityed.org/ecoeco/](http://www.sustainabilityed.org/ecoeco/). (last updated March 5, 2002).

<sup>29</sup> Further information on these discussion courses is available at the Northwest Earth Institute's website, [www.nwei.org](http://www.nwei.org).

<sup>30</sup> Further information about YES! Magazine can be found at the following websites: [www.yesmagazine.org](http://www.yesmagazine.org) and [www.futurenet.org](http://www.futurenet.org).

<sup>31</sup> For extensive recommendations, see *Education for Sustainability: An Agenda for Action*, President's Council on Sustainable Development (1995), pp.24-39.

<sup>32</sup> Many are available at [www.unesco.org/education](http://www.unesco.org/education). UNESCO also supported production of a teacher training program on ESD by Dr. John Fien of Griffith University, Brisbane Australia, which is available online at [www.unesco.org/education/esd](http://www.unesco.org/education/esd).

<sup>33</sup> Publications and activities of CED, led by Dr. Daniella Tilbury of Macquarie University Australia, can be viewed at [www.iucn.org/cec](http://www.iucn.org/cec).