EARTH ETHICS, EARTH LITERACY, AND THE COMMUNITY COLLEGE

Bradford R. Stocker
Department of ESL/Foreign Languages, Miami Dade College, Miami, Florida, USA

Keywords: anthropocentrism, ecology, cosmology, community college, Earth Ethics, Earth Literacy, education, paradigm, sustainability

Contents
1. Introduction
2. The Community College Context
3. The Obligations
4. The Case of Miami Dade College Context
5. Earth Literacy
6. Earth Ethics
7. Earth Ethics Institute
   7.1 Curriculum Factors
   7.2 Implementation Issues
8. The Next Steps
Acknowledgements
Glossary
Bibliography
Biographical Sketch

Summary

The article below will explore the current environmental crisis on Earth in all its various dimensions, with special attention given to the community college role in understanding and fostering sustainable solutions for this crisis. Miami Dade College, the largest community college in the United States, will be examined in detail in terms of its efforts to integrate Earth Literacy and Earth Ethics into its curriculum and instruction as a way to help understand the concept of sustainability and the environmental challenges facing Earth and its life support systems. The article will end with speculations about the future directions of community colleges related to sustainability and the environment.

1. Introduction

In terms of the Earth and its future, there is little doubt that the planet is in crisis and that no matter how sustainability is defined, it remains a distant hope. In the World Scientists’ Warning to Humanity of 1992, over 1700 of the world’s leading scientists and the vast majority of Nobel laureates in the sciences warned of a litany of planetary ills which threaten Earth. In 1997, in Kyoto, Japan, scientists again warned humanity. There are numerous other iterations and evidence of the state of Earth such as those from the United Nations Environment Programme (UNEP), the Millennium Ecosystem Assessment, the Scientific Committee on Problems of the Environment (SCOPE), and
more. The consensus among scientists is that Earth is threatened by human action. They state, “We … warn all humanity of what lies ahead. A great change in our stewardship of the earth and the life on it, is required, if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated.”

Data from NASA’s Lunar Prospector spacecraft supports the impact theory first proposed by William K. Hartmann and Donald R. Davis, in 1975. They theorized that when Earth formed 4.5 billion years ago, other smaller planetary bodies were developing. One of these impacted Earth during Earth’s growth process, blowing out molten debris. A portion of the debris went into orbit around Earth and aggregated into the moon. While made of the same stuff as Earth, it is clear that the moon evolved into a relatively lifeless satellite and lacked the crucial factors which have allowed Earth to evolve and develop life systems. The two images above show the dramatically different potential futures for Earth – life or less life.

Humanity is conducting a sustainability experiment in which Earth and humanity itself are at once the subject and the control. Humans are experimenting with Earth and human existence with little caution or responsible safeguards. There is no other planet to practice with or run to if this experiment gets the better of the experimenters. Following the Precautionary Principle for this experiment would seem to be the logical course of action, particularly when knowledge about outcomes is limited and the impact is potentially harmful. Yet, humans continue to act as if there were no problem.

Some skeptics of science have noted that predictions of large-scale systems failure have not occurred and they conclude the predictions are false. Paul and Anne Ehrlich point out in their *Betrayal of Science and Reason*, that data and factors change, life is dynamic, and science continually restructures what is known to fit current data. Science is not based on faith and belief and therefore, does not inflexibly hold to notions that are not supported by new data. However, it is unreasonable to say that this ability, actually, requirement, of science to adjust to new data does not mean that there is no basis for
prediction, that there is nothing certain or known. The fact that science admittedly does not know everything gives no weight to the claim that it knows nothing. While scientists may be discussing the rate of global warming, no significant portion of the scientific community claims there is no global warming.

For the purposes of this article, it is a fundamental assumption that Earth is in crisis and that the Sixth Extinction is real. It is given that humanity’s fate is inextricably linked to the fate of its home planet. The article assumes that there is still time to turn the situation around. It comments on the role of one segment of higher education, the community college, considers its function in relation to sustainability, and critically views the largest community college’s efforts. It further explores how the community college relates to other institutions of higher education and how its role situates it to exacerbate or ameliorate Earth’s predicament. The article looks at the influences that have shaped the current efforts at Miami Dade College whose size, location, and role in the community college movement make it an important case. It also considers the paradigmatic shifts and underlying principles needed to make changes for a sustainable future, and views Earth Literacy and Earth Ethics as underpinnings of the efforts at the College. Finally, the article concludes by looking at alternative future directions that are viable within the Community College context.

2. The Community College Context

Thomas Berry has written that of all the major institutions in society, including church, government and corporations, only universities have the historical insight, critical capacity and possibility of adequately guiding the human community. He writes: “In a special manner the universities have the contact with the younger generation needed to reorient the human community toward a greater awareness that the human exists, survives, and becomes whole only within the single great community of the planet Earth.” (p.80) While he does not mention specifically community colleges, they are certainly implicated. If it is true that education is a major contributor to the planetary crisis so long as it continues to educate people to conform to current economic and social trends, then the community college must be critically examined. Community colleges can be considered separately from universities because of the difference in the purported missions of the two types of institutions, the populations that they educate and train, their historical and future roles within society, the large numbers of people community colleges touch, and their sense of and connection to place. The varied roles of community colleges demonstrate how extensive the impact of the community college is on society. These roles shape their connections to the local area and influence their relationship to the issues of sustainability, Earth Ethics, Earth Literacy, and planetary survival.

The community college has an inherent connection to locality, and thus contributes to a sense of place. It is by nature, as well as name, part of the community and as such has a fundamental role in responding to the needs of the community. It has obligations to meet community needs and to provide direction through knowledge and action. Students are primarily from the region and generally are commuters. While this contributes to a diminished commitment to collegiate community, it influences the bond students have with the community in which the college is embedded. State run universities draw
students away from their homes, disconnecting their students from their families, communities, and bioregions. The fact that the community college is situated within the students’ bioregion gives it much more potential for impact on actualization of Earth Literacy and Earth Ethics, as there is a stronger pre-existing connection to the local bioregion. This enables the community college to truly “think globally and act locally.”

According to the American Association of Community Colleges (AACC), 46 percent of all U.S. undergraduates are in community colleges. This is a huge proportion of the student population. In many regions of the U.S., the local community college is the only opportunity for students to access higher education and in turn, it is formal education’s last chance to directly impact students. The fact that students can stay at home, work and study, and receive and give familial support has done much to increase the popularity of the community college. The financial advantages from local education are reflected in tuition, housing, food, and more. The community college has become the first choice of many students rather than the fallback option it once was. The community college in many cases may be the only contact students have with post-secondary education. Community college students are much more likely to remain in the same area in which they are receiving their education and therefore, what they learn literally may be directly applied at home.

Although the history of the community college in the United States is traced back to the first two year college, Joliet Junior College, in 1901, the real boom of community colleges came in the early 1960’s with the advent of the community college network and the opening of 457 public community colleges – more than the total in existence before that decade. Currently there are about 1,600 community colleges when their branches are included in the count. This boom in community colleges came at a time when there was a confluence of concurrent social booms. There was the maturation of the baby boomers (those citizens born after WWII until 1964) into college age, a robust economy (traditional, not ecological or steady-state economics), and there was a shift in the view of education from being an expense to being an investment. The peace movement, the civil rights, feminist, gay rights, and environmental movements were all impacting society and the community colleges were greatly influenced as well. The 1960s community college was responding to a push for more openness to and within education. Community colleges became examples of egalitarian and democratic principles reflected in higher education access. At this same time there was a surge of experimentation within the education world and the community college boom to some extent was riding this experimentation wave. Within the colleges there were numerous curricular experiments and innovative ideas.

The intentional change of name from junior college to community college is a semantic shift that has significant implications. The original junior colleges had a comparatively narrow mission of being an institution for the first two years of college education. There was an expressed expectation that students would go to upper division institutions to complete a bachelor’s degree. The community college has continued this role through the Associate in Arts degree, but has expanded its mission to include terminal Associate in Science degrees and certificate programs that have general education requirements but a clear vocational intention. In addition, there is a contemporary goal to increase
vocational and technological training programs. The community college also includes a large continuing education or life long learning component.

A key aspect of the change from junior to community college was to intentionally place college education within reach of more people. By the year 2000, 9.3 million people had taken credit courses and another 5 million non-credit courses through community colleges. It should be noted that accessibility, localization within existing communities, egalitarian entrance requirements, lower costs, and extra-classroom support, fall within the parameters of education for sustainability, as defined by the United Nations Environmental Programmed (UNEP) and the Decade of Education for Sustainable Development (DESD.) One of the more egalitarian, democratic ideas of the community college is the open door policy that many community colleges have adopted; it grants any high school graduate college admission. Small classes, professionalized instruction, and low expenses all make the community college very accessible and, therefore, in terms of cognitive and emotional knowledge about sustainability, the community college is probably the post-secondary institution that has the most contact with the most people in the United States.

In addition to the open door admissions policy, community colleges literally open their physical doors to the community. Community folks use college facilities for sports, meetings, relaxation, as places to walk the dog, jog and play with the kids, and more. This openness also then means that the hidden and invisible curriculum of place is influencing even those who have no formal connection. The landscape, signs, bathrooms, parking areas, buildings' architecture, open space, food services, waste treatment, personnel—all make statements that are informing people about the possibilities of built environments. It is critical to note this overall influence and reach of an institution when evaluating its role and impact on sustainability.

There are large numbers of immigrants to the U.S. and this is reflected in urban community college student populations. English as a Second Language can make up 50 percent of the enrollment at some institutions. The immigrant students come with the old American Dream, a firm belief in the notion that hard work can overcome poverty. They come with traditional concepts of material and monetary success firmly entrenched. Their ideas about education, how instruction should occur, the roles and relationships of students and professors, the aims and purposes of education are for the most part very resilient. Adoption and implementation of the ideas inherent in the new cosmology, Earth Literacy, and Earth Ethics are difficult enough for anyone who is immersed in the enculturation systems of developed countries, but for those who have left home and hearth for “a better life,” the ideas embedded in the new paradigms, while perhaps less foreign, are counter-intentional and conflict with their dreams. These students comprise a significant portion of the urban college population and they will have much impact on the Earth’s life support systems once they are established within the social structure.

The old American Dream is heavily bound in consumerist ideals and the New American Dream requires a new understanding of ecology and sustainability. This new understanding is based on the new cosmology and Earth Ethics; many immigrants may pose a particular challenge to education for such understanding.
The community college is an institution which seems to have remained particular to the United States. Just as its growth in the 1960s reflected the context of the period, it continues to be influenced by the country’s current values and consumerist attitudes. The connection between corporations and community colleges feeds the highly questionable notions that a primary role of education is to increase the individual’s “marketability” or “use-value,” so that students can get “good jobs,” and become “successful” and active members of the community. (See article Development, Education and Grassroots Movements for Sustainability and Environmental Justice in this Theme.) Under such pressure, learning for knowledge, liberal ideals, self-knowledge, broadening perspective, and critical analysis are being swept away and devalued. The notion of the “active citizen” imbued in civitas is being replaced with “active consumer.” Thus, the curriculum of the community colleges comes to reflect a consumerist mentality which has been called a commodification of education. (See article Education, The Individual, And Consumerism in this Theme.) A consumerist view of and for education makes it even more difficult for students to see their proper relationship with Earth, their global civitas, with attendant responsibilities and obligations.

A fragmented academic curriculum, broken into disciplines, with faculties that rarely connect with each other and who are often embroiled in academic turf wars, is being further distorted by corporate America. The academy finds itself defending the current academic notions against the “vocationalization” of the liberal arts and sciences. If and when the faculty unite, often it is to defend themselves against the attack on the old core curriculum of general education, the trend to use part-time instructors (academic outsourcing,) and to ward off technological intrusions that they perceive threaten their positions. Their defensiveness is based in old values schema, so, they often do not perceive the larger threat. They do not see the inherent misdirection of the present curriculum away from the planet’s crisis. To the extent faculty are caught up in old paradigms of education, they perpetuate a fractured college curriculum and consequently are less able to support education for sustainability.

Faculties often disclaim the need to know what is happening in other disciplines and defend their academic domains. English teachers may claim no understanding of systems theory, all the while teaching language, a linguistic cultural system. Biology teachers may claim to have no concern with philosophy and spirituality, while inherently teaching a narrative of the cosmos and fascination for its mystery. Ethics are often segregated into business ethics, medical ethics, and more. Thus ethics are separated from larger societal values and, consequently, are very distant from principles of Earth Ethics. As academic arrogance perpetuates the falsehood that each discipline is unique, independent, and superior, it fosters increased disconnection from Earth, promotes fragmented knowledge, reflects an unreal model of the universe, and further exacerbates faculty resistance to change toward education for sustainability.

In the less frequent instances where the faculty initiates efforts to create new programs and alternatives to the traditional educational mode, there is the added resistance of some of the accrediting agencies to accommodate these innovations. (The most notable, rarely questioned, yet highly questionable exception is the rapid embrace and acceptance of computer technology into pedagogy and culture.) Administrators, who
fear losing their accrediting agency’s approval, often nix ideas before they ever are in place in anticipation of problems. Unions struggling with relevance, credentials, course selection, and tenure are often at a loss for how to support instructional innovation. Support of education for sustainability, ecological literacy, and dynamic change that is suggested by advocates of ecological understanding is lacking at a systemic level from most constituents. This is not to say that there are no examples of green campuses. It is to say that there are extremely few examples of systemic green curriculum infused with the new cosmology even on green campuses.

The context of the community college in the United States is struggling within the current political drift to a position that is increasingly unaligned with science. As Michael Shellenberger and Ted Nordhaus point out in “The Death of Environmentalism,” so-called “green candidates” recently shied from their environmental connections in unsuccessful efforts to win political positions. The current resurgence of attacks on evolutionary sciences that is tacitly supported by the current U.S. administration demonstrates the unnatural, or anti-natural, resistance to the science-based universe story. The Union of Concerned Scientists notes an impact on scientific integrity. An anti-science ambiance in the United States creates a contextual barrier to planetary cultural and curricular reform, while in the meantime traditional liberal arts education is accused of being too “liberal.” Thus, any new curricular movement is mired in defending previously accepted science. Much of the success of anti-green efforts has been attributed to the lack of fundamental scientific knowledge in the general U.S. population that weakens people’s ability to critically question anti-rationalists. In a dangerous, vicious circle, the lack of scientific understanding and knowledge cause and perpetuate a weakness in scientific education and knowledge, which in turn is the ground for keeping science awareness weak.

Into this milieu step the relatively small numbers of people with intention to redirect the college system toward alignment with Earth Ethics through Earth Literacy. Resistance to such changes in thinking is immense and comes from many sources embedded in the culture and its institutions. Nevertheless, there are significant efforts underway to affect changes in perception and facilitate shifts in the paradigms that are currently operative. These efforts may tip the balance in favor of science, spirit, and reason. The American Association of Community Colleges, in 2004, resolved to support the UN Decade of Education for Sustainable Development. If the statement were given proper attention, it could provide community college leadership support for efforts to adopt educational practices for sustainability. It is a professional document that can be taken to boards of trustees, passed on to their deans, chairpersons, and added to restatements of college missions. It certainly can be used to even amend college mission statements.

3. The Obligations

The community college has a current set of obligations stemming from its educational mission and general role in society, from the immense impact it has on the population of the largest per capita resource consumers in the world, and from its place within the context of the planet. The impact of the community college is such that to the extent it is either educating for sustainability or not, it has a positive or negative impact on the planet. Its obligation to the planet is recognized by the AACC 2004
statement/resolution, various UN Declarations, the Talloires Declaration and the Earth Charter. Many believe community colleges have an obligation to engage in the discussion of sustainability and the planetary crisis, and to re-vision themselves in accordance with the above guiding statements, to educate for sustainability. To do otherwise is remiss of their mission to inform, to provide leadership, and to impart critical knowledge.

There is reasonable debate about the meaning of sustainability which is well addressed by others in this EOLSS Theme. Nevertheless, the definition that the UN uses may function for the colleges, at least temporarily, to initiate the work of change. The UN says sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” It is the definition that the American Association of Community Colleges has accepted in its resolution of support for the UN Decade of Education for Sustainable Development. The University Leadership for a Sustainable Future (ULSF) position is essentially that of the Talloires Declaration. The ten points of the declaration are also reasonable for community colleges to support and could contribute to their moral authority, add to their obligation to assess their institutions’ missions and actions, and give them a basis for restructuring. The Earth Charter is more detailed than the Talloires Declaration and is also worthy of affirmation.

There are numerous resources available for community college administrators to reference and use to help focus their institutional missions more on education for sustainability. However, a perusal of the above statements and resolutions reveals that very few community colleges are signatories, which begs the question. While it is important that colleges ascribe to such declarations, it is equally important to recognize that such ascriptions are only as good as their implementation and integration into all aspects of community college education. The role and impact of higher education on generations of students explicitly obligates community colleges to confront and involve students in the most overarching concerns of their lives. It is essential to help students develop an ecological and environmental awareness that embraces the concept of sustainability and leads to the formation of true Global (Earth) Citizens. The sense and meaning of community in community college should not be limited to the 20 or so kilometers surrounding the physical location of the institution.

TO ACCESS ALL THE 25 PAGES OF THIS CHAPTER, Visit: [http://www.eolss.net/Eolss-sampleAllChapter.aspx](http://www.eolss.net/Eolss-sampleAllChapter.aspx)

Bibliography

of the new Great Work of restoring the human relationship to the planet to coincide with the ecozoic age. Universities and education in general are seen as vital to the restoration of such a relationship.

Boff, Leonardo. (2005). *Cry of the Earth, Cry of the Poor*. Maryknoll, New York: Orbis Books. [Boff makes a compelling connection between social justice and ecology. He recognizes that Earth cannot heal without healing the human social fabric. Most shocking is that indigenous peoples have been murdered in order to get to the natural resources in their habitats.]


Callicot, Baird and Rocha, Fernando J. R. da. eds. (1996). *Earth Summit Ethics: Toward a Postmodern Philosophy of Environmental Education*. Albany New York: SUNY Press. [This is an excellent collection of philosophical articles on Earth Ethics, from a wide range of authors, who were part of the Porto Alegre pre-conference held before the 1992 UN Conference on Environment and Development in Rio de Janeiro, Brazil. The papers cover many significant aspects of the discussion of ethics related to Earth.]

Callicot, Baird. (1999). *Beyond the Land: More Essays in Environmental Philosophy*. Albany, New York: SUNY Press. [Callicot discusses Aldo Leopold’s ideas as they relate to the debates within environmental philosophy and how new scientific knowledge impacts Leopold’s land ethic. Callicot offers an important discussion on intrinsic value as applied to the environment as environment is traditionally understood.]

Chardin, Teilhard de. (1965). *Building the Earth*. New York: Avon Books. [de Chardin attempts to unite Christianity and science, asserting that humans are “terrestrian,” i.e., residents of Earth. The author is considered by many involved with Earth Literacy as essential and foundational in the shift to unite spirituality and science.]

Cohen, Arthur, and Brawer, Florence. (1982). *The American Community College*. San Francisco, California: Jossey-Bass Inc. [This is a standard, though dated, text on the North American community college. The historical changes, growth, shifts in missions, changes in policies, and impact on education are well discussed in this classic work.]

Dewey, John. (1997). *Experience and Education*. New York: Simon and Schuster Inc. [Dewey is essential reading in education. He was one of the first American educational philosophers to advocate experiential learning. While others in this theme have criticized him for too much reliance on science and scientific method, he is foundational to the beginnings of critical learning and cross disciplinary education.]

Erhlich, Paul R. and Erhlich, Anne H. (1996). *Betrayal of Science and Reason: How Anti-Environmental Rhetoric Threatens Our Future*. Washington, D.C.: Island Press. [This is a review and refutation of anti-environmentalists by two well recognized scientists. They present convincing evidence that attacks on rational thinking are not arbitrary and note the self-perpetuating aspects of fostering scientific ignorance.]

Kuhn, Thomas. (1969). *The Structure of Scientific Revolutions*. Chicago. University of Chicago Press. [Kuhn is most cited for his definition of paradigm and description of paradigm shifts in science. He is foundational reading in the philosophy of science and essential to correctly understand the often overused and misused term – paradigm.]

Leaky, Richard and Lewin, Roger. (1995). *The Sixth Extinction*. New York: Random House. [This book is an investigation into the rapid destruction of the planet’s bio-diversity caused by humans. The authors convincingly suggest that Earth is losing so much bio-diversity, so rapidly, that it is legitimate to call the contemporary moment an extinction period – the sixth in geological history.]

©Encyclopedia of Life Support Systems (EOLSS)
Leopold, Aldo. (1949). *A Sand County Almanac*. New York: Oxford University Press. [Leopold is considered foundational to the North American discussion of Earth Ethics. His land ethic says that a thing is right when it tends to preserve the integrity, stability and beauty of the biotic community and wrong when it does otherwise. Leopold also extends the notion of community to include the non-human elements.]

Orr, David. (1992). *Ecological Literacy: Education and the Transition to a Postmodern World*. Albany, New York: SUNY Press. [Orr cogently discusses sustainability, education, and knowledge. He proposes a pedagogy of place and makes a forceful case for the damage that unchanged education can create. The author believes and states that all education is fundamentally environmental education.]

Roueche, John E. and Suanne D. (1997). *Between a Rock and a Hard Place: The At-Risk Student in the Open-Door College*. American Association of Community Colleges: Community College Press. [This is a review of the elements of the community college open access policy and how colleges overcome the drawbacks and help students. It is important to note the criteria they use include treating the student holistically especially in areas of non-curricular support. They also note the special challenges of educating the non-traditional student, which most community college students are.]

Shellengerger, Michael and Nordhaus, Ted (2005). “The Death of Environmentalism,” www.grist.org/news/maindish/2005/01/13/doe-reprint/ [This is a very provocative article that questions the fundamental assumptions and actions of traditional environmental groups. It has caused a great backlash but also has opened a needed discussion about holding actions, lack of success, and isolationism of the traditional groups. Traditional environmental groups, (for example, the World Wildlife Fund and the Sierra Club) are out of touch with the values and needs of people outside of their constituency.]

Swimme, Brian and Berry, Thomas (1994). *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era: A Celebration of the Unfolding of the Cosmos*. New York: Harper Collins. [Swimme, a physicist, and Berry, a historian and theologian, combine the new cosmology and sacredness. They see the universe as an ever-evolving, interconnected community. Their work is an underpinning for Earth Literacy.]

Toolan, David. (2001). *At Home in the Cosmos*. Maryknoll, New York: Orbis Press. [Where Fritjof Capra brings eastern theology and quantum physics together, Toolan attempts to unite western Judeo-Christian theology and current science. He tries to move beyond the philosophical attitude of de Chardin and make more practical connections. This is clearly a deep Christian perspective that sees literacy detaching man from nature and human ethics not keeping pace with new scientific discoveries and knowledge.]

Union of Concerned Scientists (2005). “Restoring Scientific Integrity.” www.ucsusa.org [This is one of many position papers found on the UCS website. The World Scientists’ Warning to Humanity and other important resources are published at this website. It is an important watch-keeper organization.]

United Nations Environmental Programme. www.unep.org [This is the official website for UNEP and as such is an immense and current resource for educators at all levels. This and UN Decade of Education for Sustainability are essential sources for anyone connecting to this EOLSS theme].

Wackernagel, Mathis and Rees, William. (1996). *Our Ecological Footprint: Reducing Human Impact on the Earth*. Gabriola Island, B.C., Canada: New Society Publishers. [These authors make the case that traditional cost accounting economics is fallacious because it only looks at profit derived from the difference between traditional costs and income. They say that only a system that accounts for ecological impact, resource cost, and waste impacts can accurately reflect true economic reality and adequately demonstrate the real and complete costs of human actions.]

Wilson, Edward O. (1984). *Biophilia*. Cambridge, Massachusetts: Harvard University Press. [This book details Wilson’s much quoted notion that humans have an innate love of nature. Articles from this book punctuate the readings in the Green Studies courses at Miami Dade College. Wilson to some appears too anthropocentric and is vulnerable to such criticism as here he suggests that because we have not discovered all of the potential (to humans) of the natural world we should be cautious of its early disappearance.]
Biographical Sketch

Bradford Stocker, has been an educator for almost forty years. His experience ranges from pre-school to graduate school and all levels in between, crosses many disciplines, and includes many alternative learning programs and methods. He has been a Fulbright Scholar and has had professional experience in a number of cultures. His research has included challenging the use of technology in education, humor in teaching, and most recently the incorporation of Earth Ethics and Earth Literacy into the college curriculum and institutional culture of Miami Dade College. He leads many faculty development experiences in these areas and presents and writes on the subjects. He is currently pursuing a post-doctoral certificate in Ecology and Human Spirit.