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Environmental Justice in Education

Drinking Deeply from the Well of Sustainability

Environmental education without environmental justice leaves students thirsty for answers about different ways of knowing, equity of resource distribution, and environmental health. Choosing between environment and equality, rather than seeing these issues as integrated, separates education from lived reality. To realize the possibilities as well as the barriers to sustainability, environmental education should be approached within an environmental justice framework. After all, sustainability is about sharing the planet's resources in equitable ways with the future, at its most fundamental level. This distributive justice, when extended to present generations, recognizes that the costs of resource development and technological expansion should be borne by those who reap its benefits.

Since environmental disparities reflect larger societal inequities, environmental justice education acknowledges differences in power across race, gender and class. Environmental justice education has the potential to bring to the surface ethical and political questions, such as the important question: "Who benefits and who loses from education and developmental priorities?" These questions uncover unfair and inequitable conditions and loss of community control that undermine sustainable livelihoods and healthy communities. Communities vary considerably in terms of the influence of outside forces upon them and their ability to determine appropriate development in light of today's economic, political, environmental and social forces.

Although environmental change is nothing new, the number of changes/ problems and their magnitude are increasing with toxic contamination, ozone depletion, resource scarcity and mass extinction of species. It is difficult to comprehend that more people in the Two-Thirds world are dying from pesticide poisoning than certain common diseases (Shiva, 1995, p. 45) and that governments allows corporations to mass-produce chemicals they know cause cancer and a "biological ozone hole" in the human race (Hawkins, 1993, p. 145). Nature's constant state of flux has been accelerated by industry, the green revolution, consumerism, and the military such that environmental change is appropriately described by an Inuit elder, Mabel Toolie, as "the Earth is faster now" (qtd. in Krupnik and Jolly, 2002, p. 7). Such changes alter the quality and quantity of environmental resources, increasing the vulnerability and diminishing the sustainability of communities dependent on the environment for subsistence. A dependence on a compromised local physical environment, without wealth to import resources from elsewhere, limits the options for survival.

Education provides a means for peaceful change rather than being merely a means of adjustment to brute facts or solely having utility for individual survival (Barndt, 1989, p. 18). However, rather than teaching for a more sustainable and

equitable future, education often supports the status quo. This chapter looks at environmental education as it is presently practiced and then describes the potential of taking an environmental justice framework that considers: 1) different ways of knowing; 2) resource distribution inequities, and 3) the disproportionate environmental health risks that further burden the disempowered.

Environment Education

The term Environmental Education was officially defined for the first time in 1980 at the joint meeting of The World Conservation Union (IUCN) and United Nations Environmental Scientific and Cultural Organization (UNESCO) as "the process of recognizing values and classifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings" (IUCN cited in Palmer and Neal, 1994, p. 7). Agenda 21, which resulted from the Earth Summit in Rio in 1992, states the importance of education in its introductory notes for chapter 36:

> Education, raising of public awareness and training are linked to virtually all areas in Agenda 21, and even more closely to the ones on meeting basic needs, capacity-building. (United Nations Department of Economic and Social Affairs, 1992)

Education is a massive priority having a huge potential to liberate. There is a particular priority to provide education for those who have traditionally been denied this right such as the poor, girls and women in majority world countries. This education would open up opportunities, a wider world of experience, as well as empower and thereby support social and economic development (Chambers, 1997). The arguments for teaching environmental education in schools are similar to those for teaching science or math: it is a part of human understanding and experience. Even more important is the potential of environmental education to promote healthy communities and dignified human existence at peace with nature and with other human beings. Environmental education reflects a collective perception of the human-nature relationship and what is necessary to pass on to future generations (Gómez-Pompa and Kraus, 1992). This perception underlies and shapes the visions of appropriate actions formed by individuals and groups. The question remains, however, as to how sound this vision is.

Environmental education has matured from a strict wilderness and science-base in the 1960s and '70s to focus on urban and social issues in the 1980s and '90s. The history of environmental education was summarized by Joy Palmer (1998), which I remodel from a time line into an organic tree trunk-like diagram below to show its living, evolving nature through growth rings in Diagram 1. In the new millennium, Palmer predicted a community of partners working together to identify and resolve socio-ecological problems, which I further elucidate to include environmental justice, environmental health and traditional ecological knowledge as the next step to unite science, values, culture and social issues.

Diagram 1: Environmental Education's Shifting Focus over Time

Diagram builds on Palmer (1998), which summarizes history to 1990s.

Diagram 1 does come with the disclaimer that although the scope of environmental education has grown, limitations have confined its range to ecology, conservation, outdoor education, and biology persist. Environmental health, environmental justice and traditional ecological knowledge are not the mainstay of most environmental education programs. In Canada, environmental

education "is still being viewed as narrowly focusing on knowledge about natural resources and their management" (Lin, 1999, p. 211). Trevor Herriot (2000) in his book, *River in a Dry Land*, writes: "We have done much to reduce our conversation with the land to a monologue of demands and plunder and although we do not have the myth mind of the original listeners, we do have other faculties, the will, imagination, though, emotion and memory … with these we can again listen and respond" (p. 3). Educating outdoors or "outdoor education" can be a practice that recognizes and respects the vital function, beauty, rights and pedagogical importance of the natural world. However, creating satisfying links between people and nature are important, but not sufficient to improve people's quality of life and ecosystem health. A community cannot survive without meeting basic human needs: adequate and appropriate housing, health care, transportation and other human infrastructure needs must be met for people to have productive and good lives.

Environmental education today is challenged to consider the environment in its totality, natural and built, technological and social, and view itself as a continuous life-long process that takes place both inside and outside the classroom. This challenge demands critical thinking about environmental problems and the ideologies and systems at work that are contrary to promoting healthy social and natural environments (Clover, 1996). Education for sustainability means holistic school development using environment-oriented activities with active involvement of all stakeholders and most importantly local communities. Jennifer Young (2001) analyzes environmental education's shift to education for sustainability, asking: "Is education for sustainability simply the next step in environmental education? Or is education for sustainability a convergence of education-concepts for social change including environmental education and development education?" (p. 7). She considers education to have four foundations, namely emotional connection with nature, ecological understanding, ethical questioning and political competence.

Environmental education has been subject to the general goal of western education to train, educate and socialize competent members of society towards individual success and overall economic growth. However, the meaning of "competent" does not include the ability to reflect critically on the overall economic, political and environmental context (Hart, 1992, p. 11): generally Western education accepts the ideology of abstract, quantifiable growth and productivity. Mechthild Hart (1992) criticizes education as creating an "industrialized mind, which is becoming incapable of experiencing its own experience" (p. 12). While pretending to be ahistorical, apolitical, neutral and objective, the values of the elite, which include individualism, competition and private consumption, are taught both by the content and the authoritarian and divisive methodology (Barndt, 1989, p. 18). Workers are trained to be subordinate to the economic system: and so when Nicaragua was called a "banana republic" the dictator Somoza is quoted as saying: "I don't want educated people. I want oxen" (Barndt, 1989, p. 29). Formal education can be an oppressive tool for the 'oppressed' and those disadvantaged through colonization (Freire, 1968). Critical pedagogy describes education as a means of social interaction which either domesticates or liberates the learners (Freire, 1968). Michelle Russell poses difficult questions for educators to assess their own bias towards elitist western education:

> You must decide if you are going to lend your minds as well as your bodies to reproducing the hierarchies and inherited privilege that shore up

> colonialism's power. The central question, of course, is "What version of civilization will you construct?" What truths will you tell each other and leave for future generations? What truths will consistently inform your plot? How will you define yourselves in relation to the central patterns of domination in the world, and how will you align on the side of freedom? (qtd. in Hart, 1992, p. 13)

That many urban children think food and medicine comes from the store and not from the land highlights how deeply market culture, rather than nature, defines the urban world. While educators struggle with protocols to protect students from commercial messages in schools, the classroom accounts for 13 percent of students' time. For the remaining waking hours these youth are immersed and actively participating in a vigorous marketing culture. According to *Marketing Magazine* a teenager visits the mall 54 times a year on average and buys something half the times they visit: particularly for girl teenagers "shopping is their number one hobby" (cited in Ziola, 2002/03, p. 16).

From a student's perspective, an understanding of the environment is considered principally as their community. Ozone, climate change and rainforest destruction, consequently, seem not to have a real and clear impact on students' lives, because its local relevance is difficult to understand (Bachiorri, Mutti and Pioli, 1995). Rather than pristine wilderness, environment should be seen as where they work, live and play—their community, in other words (Di Chiro, 2000, p. 303). A sense of belonging and sense of place relate to people's attachment towards their community. When people feel a sense of belonging, they also feel as if they have a stake in a place. Environmental education (and all subjects) becomes relevant when issues that deeply concern people (e.g. racism, sexism, poverty, pollution, food security, substandard housing, unemployment, exploitative working conditions, tolerance for economic blight, and the production of hazardous products) are discussed. The nature of the issues provokes emotion, interest, controversy, and expressions of concern for social justice, democracy, health and empowerment. Local examples and issues, linked to global issues, transform the theory into life. The role of community in environmental justice is the site for generating sustainable activities. "Community becomes at once the idea, the place and the relations and practices that generate what these activists consider more socially just and ecologically sound human/environment configurations," according to Giovanna DiChiro (2000, p. 303).

Environmental Justice

Environmental justice addresses the two most serious problems facing our world today—inequality and environmental destruction. By asking: "Who wins and loses from development, education and technological expansion?" environmental justice tries to uncover and eliminate unfair and inequitable conditions that underlie unsustainable development to achieve sustainability for all. Environmental justice looks at power issues and tries to empower the less powerful (Lee, 1993).

Environmental justice struggles result from a multiplicity of threats to community health, autonomy and livelihood from inequitable development policies and resource depletion. As environmental disparities reflect larger societal inequities, issues related to race, class, gender and other power imbalances are instrumental in determining environmental impacts, resource allocation and toxic chemical contamination. Environmental justice is seen within a historical context:

> Exploitation of people of colour has taken the form of genocide, chattel slavery, indentured servitude and racial discrimination—in employment, housing and practically all aspects of life. Today we suffer from the remnants of this sordid history, as well as from new, institutionalized forms of racism, facilitated by the massive post World War II expansion of the petrochemical industry. (Lee, 1993, p. 6)

This shifts the focus from natural resource conservation to human and ecosystem survival in terms of meeting basic needs including community self-determination, and cultural integrity with its human's rights and ecological democracy tenets. Principles defined by the First People of Colour Environmental Leadership Summit in 1991 include: clean air, land, water and food to be a fundamental right; safe and healthy work and living environment; workers and community members participating as equal partners at every decision-making level in community planning; the fundamental right to political, economic, cultural, and environmental self-determination of communities; and, the cessation of the production of all toxins, hazardous wastes and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and containment at the point of production (White, 1998, p. 76).

Many human relationships can be understood in terms of hierarchies of power and authority, resulting in dominance and subordination. There are various axes of power so that individual persons can both dominate while simultaneously suffering all the insults and injuries of subordination. Global polarization of wealth and power has the temperate North dominating the tropical South, even after colonial times, through military might and debt. At a personal level, power dynamics are based on biological and social conditions, which are beyond the control of individuals, as well as occupational, sequential and role hierarchies, which are more malleable and change with time. The dominators, consciously and unconsciously, deny the realities of subordinates and seek to impose on them their own realities (Chambers, 1997). For India, Malcolm Adishiah laments that: "In the majority of our schools, the technique of teaching is a one-way speaking style, with the teacher pouring forth words of wisdom and the students listening passively" discouraging thinking for oneself in favour of "repeating faithfully what someone else has said, now pervades the whole education system" (qtd. in Chambers, 1997, p. 61). Similarly, a teacher in Northern India complains: "The people we have trained have stripped peasants of their power" (qtd. in Chambers, 1997, p. 62). Some students rebel, but most grow up conditioned to fit in, reinforcing the hierarchies of authority and obedience which they find again in work and life after their formal education. Those who had sticks waved at them in school go out and later wave sticks at others.

On a wide scale, dominating approaches result in the: overriding of local priorities, inhibition of participation, obliteration of diversity, and dissemination of technologies which do not fit the local needs of the poor, women and rural communities. That this system does not work does not register: dominating behaviour is unreceptive to feedback from subordinates (Chambers, 1997). That is why it is important to examine the power relations shown in Table 1 along various dimensions.

Table 1: Patterns of Dominance

Dimension/context	*Dominance*	*Subordination*
Spatial	Core (urban, industrial)	Periphery (rural, agricultural)
International and developmental	The North, IMF, World Bank, Donors Creditors Outsider, professional	The South Poor countries Recipients Debtors Local person
Inborn and social	Male White High ethnic or caste	Female Black, Indigenous Low ethnic or caste
Life Cycle	Old person Parent Mother-in-law	Young person Child Daughter-in-law
Bureaucratic organization	Senior Manager Official Patron Officer Warden, guard	Junior Worker Supplicant Client 'Other rank" Inmate, prisoner
Social, spiritual	Patron Priest Guru Doctor, psychiatrist	Client Lay person Disciple Patient
Teaching and Learning	Master Lecturer Teacher	Apprentice Student Pupil

Table adapted from Robert Chambers (1997)

Rather than blame the disempowered it is very important to see the standpoint of the oppressed, a point stressed by Nancy Hartsock (1983):

> The vision available to the oppressed group must be struggled for and represents an achievement which requires both science to see beneath the surface of social relations in which all are forced to participate, and education which can only grow from struggle to change those relations.… As an engaged vision, the understanding of the oppressed, exposes the real relations among human beings as inhuman, points beyond the present, and carries a historically liberatory role. (p. 285)

The environmental justice movement is concerned with systemic discrimination, which disempowers certain groups in society, particularly at the intersection of environmental protection and development. Institutional and systemic discrimination are most often identified by outcomes: systems can promote, sustain or entrench differential advantage or privilege to people of different classes, genders, religions, races, etc. Without empowerment, individuals and communities can be buffeted and manipulated by forces outside their control. Prerequisites for achieving empowerment include access to information and expertise, ability to process that information, i.e., to understand the problem or set of circumstances, and the ability to shape and have input into the decision-making process (Chambers, 1997).

Environmental justice seeks the structural and historical causes of problems to foster a critical analysis in students. This breaks the powerful taboos that prevent inquiry regarding: the hierarchical occupational structure, the unequal distribution of jobs and joblessness, the continued existence of sexual and racial discrimination, and the ongoing destruction of the environment. The most stringent taboos often concern any mention of the structural violence and, in many cases, direct violence that characterizes the working and living conditions of millions of people like that described by Ann Danaiya Usher (1995):

> In the extreme case, when nature is so degraded that it can no longer provide, one of the only remaining local resources in the community that has value on the market is the bodies of the young. In those places where adolescent women—and to a lesser extent, men—leave home to sell their labour in the sex industry, AIDS, which appears to have infected a huge proportion of the country's half-million prostitutes, has become a physical manifestation of political dispossession. (p. 11)

Environmental justice would expand environmental education, as well as other subjects, to include different way of knowing, resource distribution, and environmental health.

Ways of Knowing

Educational theorists, with few exceptions, frame issues in a way that ignores basics needs and the environment, although many theorists, including Paulo Freire, Peter McLaren and Henry Giroux frame their analyses of cultural domination in a class analysis (see Bower, 2001). Chet A. Bower (2001) writes that education, even in the area of social justice, reproduces assumptions shared by Enlightenment thinkers and promoters of the Industrial Revolution:

> The modern agenda of "high-status knowledge" learned in public schools and universities is expanding a secular, technological, consumer and expert-knowledge-based world. However, this creates numerous double binds for cultural groups that still retain values and ways of thinking that separate them from the culture of modernism. (p. 66)

Many authors criticize the formal schooling system for imposing 'superior truths', which often prove detrimental to local knowledge systems. Although often accepted as gospel, they are really a conclusion drawn from a limited data set that explain what scientists know to date about a topic, based on their training and interpretation of the information available (Gómez-Pompa and Kraus, 1992). Scientific facts may be replaced by another truth in light of new information that does not fit the old paradigm. For example, ecologists no longer defend the concepts of climax communities and ecological equilibrium that were for almost a century the basis for scientific research, resource management and conservation teachings. Nonequilibrium models now influence ecological theory, and nature is increasingly perceived as being in a state of continuous change (Gómez-Pompa and Kraus, 1992). Environmental science and ecology are often focused on controlling nature. According to Donald Grinde and Bruce Johansen (1995): "The emphasis on environmental control (such as the maintenance of 'wilderness' and 'recreation' areas) runs counter to an ethic of harmony and inter-relatedness, and as such environmental control is as exclusive in its practices as any timber or railroad baron of olden times" (p. 271).

The criticism that education is elitist extends to environmental education which

often neglects the perceptions and experiences of people who have a firsthand understanding of their surrounding natural environment as a teacher and provider. “Many environmental education programs are strongly biased by elitist urban perception of the environment and issues of the urban world” (Grinde and Johansen, 1995, p. 271). Learning from individuals who directly depend on the land for their physical and cultural subsistence would help dispel the frontier myth so prevalent in colonial history that separates nature and people. Western education excludes Indigenous peoples’ wisdom, based on its failure to live up to European norms (Churchill, 1999). These norms involve assumptions about “savages” and other universalizing concepts inherent in the discourse of Eurocentric scholars. Values of environmental justice require that other ways of knowing, including traditional ecological knowledge, be incorporated and respected in the education process.

Eurocentrism denotes special privileging of European norms, values, institutions, and peoples, but also the active and conscious diffusion of this ideology outward from a centre that is Europe. There is much to learn from Traditional Ecological Knowledge, which differs from the Eurocentric ideology regarding resource development, land ownership, social control and other configurations of European power. Knowledge and values of “ecosystem people” (Parajuli, 1997), which have a reciprocal relationship with their respective ecosystems, is very different from “biosphere people” who draw on resources from afar, and often transform those resources through industrial processes. The interest of ecosystem people is to ensure the long-term availability of the natural resources of their own localities. Thus, ecosystem people have evolved knowledge about plants and animals, their habitat preferences, local distribution, life histories and local distribution. Much of this knowledge is put to use in obtaining food, drugs, and other necessities and in avoiding crises caused by drought, floods and other natural calamities (Parajuli, 1997). Nature is seen as “socialized” rather than as “pristine” and/or to be “preserved.”

Our beliefs and assumptions blind us to the fact that, in many cases, the traditional land-use practices of the rural sector are responsible for maintaining and protecting the biodiversity of our wilderness and have often provided the genetic diversity that strengthens the world’s major food crop varieties (Altieri and Merrick, 1987). The concept of wilderness as untouched or untamed land is mostly an urban perception, the view of people who are far removed from the natural environment they depend on for raw resources. With this wilderness concept comes an assumption that there is an inverse relationship between human actions and the well-being of the natural environment (Altieri and Merrick, 1987). Viewed from afar land is there to be conquered, colonized, grazed or preserved (Altieri and Merrick, 1987). However, scientific findings indicate that virtually every part of the globe, from the boreal forests to the humid tropics has been inhabited, modified or managed throughout our human past. Archeological, historical and ecological evidence increasingly shows not only a high density of human population in the past with sites of continuous human occupation over many centuries but also an intensively managed environment (Altieri and Merrick, 1987). In contrast, although nature writers such as Henry David Thoreau and John Muir questioned industrial development, it was not until the appearance of Aldo Leopold’s *A Sand County Almanac* (1947) and Rachel Carson’s *Silent Spring* (1962) that an awareness of the need for a land ethic entered western public consciousness.

A variety of authors discuss how sustainable societies that preserve ecological

capital are undermined by unsustainable societies that draw down ecological capital through trade (e.g., overfishing, fur trade, mining, green revolution) and formulating government policies outside of ecological and cultural contexts (Churchill, 1999; Parajuli, 1997). For example, "toxic" impacts on the Arctic that undermine sustainable livelihoods go beyond merely the long-range atmospheric deposition of mercury and persistent organic pollutants (POPs) and also include climate change, and government policies such as the relocation of traditional inhabitants/ecosystem dwellers. Atmospheric pollution, over which Northerners believe they have little or no control, debases the sustainable lifestyles of Aboriginal peoples. This lack of control is furthered by the depletion of wildlife (e.g., the Peary Caribou are now endangered in High Arctic), restrictions placed on traditional hunting and gathering practices such as the small scale hunting on polar bears and Beluga whales in Canada. This is all compounded by a mandatory education that disregards and even denies place-based knowledge and languages (Marcus, 1995).

Formal education, as promoted by the state, has contributed to the marginalization of indigenous knowledge, whether in the Philippines, Africa, New Zealand, South or North America. In the past, massive disruptions of cultures occurred when Aboriginal students in North America suffered by being taken away from their culture, language and family and were forced to grow up in residential schools, so that they missed learning parenting skills and cultural integration. Education was used to disrupt and try to replace one culture with another. In this already horrific process, and likely related to the assertion of cultural dominance, many children suffered physical and sexual abuse at the hands of their oppressors:

> The curriculum was the same as … the provincial school system except for the courses in religion and in how to be ashamed of being an Indian. Children were taught about all the advantages of White life and all the evils of First Nations' isolation, language and culture. Besides delivering second-rate education, these institutions were also used by Indian Affairs for many other purposes—enforcement, punishment, and terrorism, to name a few. (Paul, 2000, p. 259)

With this history it should be no surprise that schools have had a negative impact on language retention and use of some First Nations peoples (Brockman, 1997). This is devastating considering that most traditional cultures are orally based, and thus do not have written histories that can later be recovered or relearned. Indigenous language itself (as opposed to translations) is the primary means by which traditional cultures are shared and passed on; its loss erodes traditional knowledge transmission. Of Canada's 53 Aboriginal languages, only three—Cree, Inuktitut and Ojibway—are considered strong enough to survive into the next century. According to the Assembly of First Nations, other Aboriginal languages are at risk (66 percent), endangered (30 percent), declining (25 percent), or in a critical situation (11 percent) (Brockman, 1997). Traditional knowledge exists among all First Nations; however its transmission to future generations faces many barriers because of the rift caused by Western education and colonialization:

> The Western education system continues to fail to teach the values, beliefs and principles which underlie Traditional Knowledge. In addition, time spent in residential schools or day schools has limited the opportunity for Traditional Knowledge to be passed on to younger generations…. In the changing world where Euro-Canadian power and control appeared

> insurmountable, many elders questioned the value of their knowledge for younger generations in the modern world. At the same time young people became less receptive to the language, the information and the style of traditional teachings which contradicted everything they were taught and learned in school. Young students have less time for year-round exposure to Traditional Knowledge on the land and much more exposure through the media to the dominant society. (Brockman, 1997, p. 4)

Traditional Ecological Knowledge is a body of knowledge built up by a group of people through generations of living in close contact with nature (Battiste and Henderson, 2000). Traditional or indigenous knowledge is cumulative and dynamic, building upon the historic experiences of a people (Battiste and Henderson, 2000). While those concerned about biological diversity will be most interested in knowledge about the environment, this information must be understood in a manner that encompasses knowledge about the cultural, economic, political and spiritual relationships with the land. UNESCO (1999) cites the importance of traditional ecological knowledge and the need for government to provide active support for its transmission—not just in isolated communities but in universities and other educational and international organizations.

> Governmental and non-governmental organizations are encouraged to sustain traditional knowledge systems through active support to the societies that are keepers and developers of this knowledge, their ways of life, their languages, their social organization and the environments in which they live, and fully recognize the contribution of women as repositories of a large part of traditional knowledge…. Governments, in co-operation with universities and higher education institutions, and with the help of relevant United Nations organizations, should extend and improve education, training and facilities for human resources development in environment-related sciences, also utilizing traditional and local knowledge. (UNESCO, 1999)

A pro-indigenous education system is required for our collective struggle for human development and peace (Enkiwe-Abayao, 2004). In her 2002 book on the integration of knowledge systems, African educator Catherine Odora-Hoppers (2002) explains, “Indigenous Knowledge Systems enable us to move the frontiers of discourse and understanding of the sciences as a whole and to open new moral and cognitive spaces within which constructive dialogue and engagement for sustainable development and collective emancipation can begin” (p. 25). Including local knowledge systems into school curricula and government decision-making on land use promotes relevance, interest, cultural sensitivity, ownership, and self-esteem among children and local communities. Integrating local knowledge systems into school curriculum has been attempted by development NGOs and a few motivated educators. It is noteworthy that the Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) (1994) has valorized local ecological knowledge of tribal and poor children and communities across India through biodiversity contests at schools. The Peoples Biodiversity Registers program was launched in Southern India to incorporate this local knowledge to protect intellectual property rights (Gadgil et al., 2000). This grassroots program has demonstrated that Traditional Ecological Knowledge (TEK) at the community level can be successfully conserved and prevented through local level documentation in collaboration with schools.

It is time to elevate the understanding of culture, and correct misinterpretations. Any system of learning that promotes “imagined cultures” and activities that

romanticize traditions of the past that have long changed will only deter the cultural development of the indigenous peoples (Lundy, 2002, p. 83). Randy Lundy (2002), a Cree and "Aboriginal writer," writes about approaching Aboriginality, not as misconception, but as "being-at-home-in this landscape": "Although Aboriginal cultures share a prior historical and cultural claim to their landscape, the passionate attachment or ecstatic attention that can and must make this place home is open to all who are willing to look and listen. As individuals and cultures, we must have the courage and the will to do so" (p. 83).

The 2005 social studies curriculum for Manitoba is described as the first in North America that incorporates the history of the cultural groups that make up the land, with their own perspectives on political, social and cultural historic events previously interpreted only by western Europeans (Manitoba Education and Youth, 2005). Each aspect of writing and revising the curriculum involved Anglophone, Francophone and Aboriginal educators—as well as Ukrainian, Japanese, Jewish, Chinese, Islamic and other cultural groups. Nevertheless, the lack of multicultural textbooks continues to be a problem, according to Anne Longston (qtd. in Manitoba Education and Youth, 2005, 23): "The department needs publishers to commission new textbooks…. Anything older than five years has too much cultural, national and gender bias."

In contrast to the denial of an environmental-health link (McMurtry, 1999), Aboriginal people include the health of the land, the people, and traditional culture in their concept of health. In her international study of Aboriginal communities Lorelei Lambert Colomeda (1994) found environmental-health beliefs commonly held worldwide:

> Although each tribe is culturally, linguistically, and spiritually different, most subscribe to the traditional belief, that health reflects living in harmony with the Earth and that the Earth itself is a living organism. (p. 4)

For a people who depend on subsistence living the health of the land is the health of the people. The Earth is considered to be the giver of all life, food, shelter, and medicine. The other side of the coin is that a person should treat her or his body with respect, just as the Earth should be treated with respect.

Environmental-Health Link

Health education tools and interventions are usually based upon an individual exerting greater responsibility for health, which is an easier task for the "worried well" of the middle and upper class, who can buy healthy lifestyles rather than the poor who cannot afford to. The environmental health link becomes obvious in comparing the health of people in the developed and developing world. Almost one in five people in all the developing countries are not expected to survive beyond 40. Sierra Leone has the lowest life expectancy in the world—about 38, less than half of that of Japan, which has reached 80 (United Nations qtd. in Seabrook, 2003). While 20 percent of children born in the poorest countries will still die before the age of five, in the richest countries less than one percent will do so (United Nations qtd. in Seabrook, 2003). Increasing longevity in industrialized countries was due to a remarkable improvement in public and environmental health, particularly sanitation and water. Growing life expectancy and declining child mortality in the two-thirds world is only in small measure due to improved sanitation (since 2.8 billion people in the world exist with no satisfactory waste-disposal system), and largely the result of rehydration therapies and cheap drugs.

Focusing on drinking water, without which human survival is limited to three days, the vulnerability of humans to unsustainable development is exposed. Much more has to be done if child mortality is to be reduced. Today, an estimated 1.2 billion people do not have access to safe drinking water and 450 million people in 29 countries suffer chronic water shortages, particularly in Africa and the Middle East (CIDA, 2002). By 2050, some two-thirds of the world's population will be affected if current rates of consumption, privatization, pollution, and water-hungry development continues (Godrej, 2003).

Ivan Illich (1976) astutely asserts that human health is closely correlated to social factors. "Healthy people are those who live in healthy homes on a healthy diet in an environment equally fit for birth, growth, healing, and dying; they are sustained by a culture that enhances the conscious acceptance of limits to population, of aging, of incomplete recovery and ever imminent death" (p. 271). However, rather than representing a focus of interest in western medical and health studies, the physical environment is a minor background variable (Fitzpatrick and LaGory, 2000). Even in public health, where environments historically have been considered important potential causes for illness, current multi-causal epidemiological models of disease have shifted their focus away from the environment. This newer approach attributes health risks to the characteristics of individuals rather than to environmental factors, and focuses on individual rather than population outcomes. Unquestionably, impoverished neighbourhoods and countries are places where basic needs are less likely to be met: they are less safe and more polluted, with fewer community services. It is the poor and marginalized of the world who bear the brunt of pollution, resource degradation and dislocation, whether as a result of a dam, toxic waste, lack of arable land, ozone depletion or global climate change, simply because they are more vulnerable and lack alternatives. The American College of Physicians recently asserted:

> One of the most important characteristics [of the health care challenge] is the interrelationships among health and social and environmental problems. The so-called "urban health penalty"—the confluence of circumstances such as poor nutrition, poverty and unemployment with deteriorating housing, violence and loss of services—has created a deepening health crisis. (qtd. in Fitzpatrick and LaGory, 2000, p. 200)

While there is a disconnection in Western thinking between the well-being of two intertwined life-systems—that of humans and the planet—many studies show the link. Scientific findings show greater health risks for people living near (Benedetti, Lavarone, and Comba, 2001; Knox and Gilman, 1997; Paoliello et al., 2002; Ransom and Pope, 1992) or working (Barsano and Thomas, 2002; Zahm et al., 1997) in toxic industry and waste disposal sites (Vrijheid, 2002; Knox and Gilman, 1997), and for subsistence fish-eaters impacted by industrial contamination from both local industry and long-range pollution (Wheatley and Paradis, 1996). In summarizing the available literature on environmental justice, Fenchui Liu (2001) states: "Most studies have found that the poor and minorities now bear a disproportionate burden of potential or actual exposure to environmental hazards from air pollution to toxic wastes, while a few offer conflicting evidence" (p. 268).

Toxic development is more likely in poor neighbourhoods, as they, relatively speaking, lack resources, knowledge of risks and political representation to organize effective resistance as the poor expend more of their energy and resources on mere survival. Reserves, communities of colour and poor communities lack

control over resources and political clout to halt unwanted development and demand proper regulation. They bear disproportionately high and adverse effects, as they are more dependent upon their surrounding environment (e.g., subsistence living), more susceptible to pollution and environmental degradation (e.g., reduced access to legal, technical and medical resources), and are often less mobile or transient than other populations (e.g., unable to relocate to avoid potential impacts). The privileged insulate themselves from environmental problems in many ways including their ability to move away from them and importing products for consumption (Seager, 1993). The result is that privileged people, including those with decision-making power, are often spatially distant from environmental hazards and do not share the health risks to the same degree as marginalized members of society.

As development is largely driven by industry, corporations wield considerable power over communities—particularly those in need of jobs. With a desire for profits and expansion, corporations replace natural products, like wood, plants and wool, with synthetic products, like chlorinated plastics, which result in more persistent and more toxic pollutants. Many of the most dangerous chemicals are generated by the chlorine industry, including chlorinated fluorocarbons (CFCs) that destroy the ozone layer and pesticides, like DDT. The Union Carbide disaster in Bhopal, India shows the danger of "business-as-usual." Union Carbide released 40 tons of a deadly mixture of toxic gases that killed 12,000 people and permanently and seriously injured half a million people (Shiva, 1995). That Union Carbide incorporated risk into its production design is clear. To maximize profit Union Carbide took grave risks by: producing a dangerous product in a populous area, using an outdated unsafe process of manufacturing, applying secrecy in all procedures, breaking safety standards, cutting costs, laying off key staff and, operating a badly deteriorated plant (Shiva, 1995). The conflict between the government's protection of its political and economic interests, in its pact with capitalism, is at the expense of its obligation to safeguard human health.

The working poor who frequently work as labourers in manufacturing, mining, service, and others industries are disproportionately exposed to higher levels of toxic chemicals in their workplaces. Due to lower real estate prices the poor are also much more likely to live near toxic industries. People exposed to pollutants at work accumulate higher levels of pollutants than the general population because exposures are more intense and frequent.

The toxic economy that undermines human health is interwoven with the patterns of production and consumption. Although non-toxic alternatives exist, toxic chemicals have become part of "business-as-usual," as well as "consumption-as-usual." Consumer products such as hair sprays, deodorants, perfumes, cleaners, paints and pesticides release a variety of compounds that are either toxic or not fully understood and may be harmful to our health. In the form of aerosols, gas, fumes or dust, toxic chemicals can penetrate the lung's defenses to enter the body. Toxic chemicals can be absorbed through the skin in lotions or cleaners. Many personal and household products contain toxic chemicals, including alcohols, esters and aldehydes and synthetic organochlorines. While the link between cosmetic use and higher cancer and myeloma rates has often been asserted, women are the target of the anxiety-producing message of the cologne and other cosmetic industry advertising that promotes "the cult of hygiene." Alison Anderson (1997) comments on the negative health effects on women of the cosmetic industry's advertising message:

> Just as the domination of nature often results in its destruction, the

> advertising imperative that the female body be sanitized, tamed, powdered and redolent only of perfumes has led to dire health consequences. (p. 134)

An extreme, yet increasing common cosmetic product is a skin whitener that is being marketed to women of colour striving for the white beauty ideal. One brand of skin whitener is being heavily advertised on MTV Asia. These products often contain lead or mercury.

The biomedical model is increasingly considered limited compared to a socio-medical model that recognizes the social construction of disease (Anderson, 1997). The biomedical model largely marginalizes the area of environmental health, and considers primary prevention strategies that keep people from getting cancer and environmental illness as hypothetical concepts. In the socio-medical model, however, the emphasis is on social and environmental factors including: stress, social support, poverty, discrimination, mass-media influences (e.g., emaciated role models), the neighbourhood, community and ethnic context, and the power of corporations in producing an unhealthy situation (e.g., the tobacco industry targeting children). There is a growing realization within medicine and public health that societal forces actually shape and create the disease patterns experienced by a society, and that successful health interventions require addressing the social and environmental factors that produce them, particularly poverty impacts.

Resource Distribution

Resource distribution is in complex interaction with the power structures of capitalism, patriarchy, racism and colonialism. Issues related to race, class, and gender, have been, and continue to be instrumental in the allocation of resources. This is because race, class, and gender locations are "ideological in that they provide a foundation for and are imbricated within legal, economic and political processes" (Williams, 1997, p. 4).

Livelihood issues are defined as a community's struggle to gain access to or control over the natural resources upon which their lives and livelihoods depend (Pullido, 1996). The Third World environmental struggle has been characterized as one of sheer survival, and not enhancing the quality of life for poor and landless peasants, women and tribal peoples. As a result, economic redistribution is considered to be an urgent need in the developing worlds. The rapid "free market" development continues to cause major social and ecological dislocation threatening to obliterate peasants' way of life in the developing world as well as in marginalized communities in the purportedly developed world.

The United Nations reports that 1.2 billion people in the world live on less than a dollar a day (qtd. in Seabrook, 2003). Half the world's people live on less than two dollars a day. The income of the richest one percent of people in the world is equal to that of the poorest 57 percent (United Nations qtd. in Seabrook, 2003). Women are still the poorest of the poor, representing 70 percent of those in absolute poverty (United Nations qtd. in Seabrook, 2003). Women work two-thirds of the world's working hours, produce half the world's food, yet earn only ten percent of the world's income and own less than one percent of the world's poverty (United Nations qtd. in Seabrook, 2003). Environmental sexism is not only environment, development and health policy that disregard women in their setting but also women being placed at higher risk than men as they typically have less power and means in society, which results in women having: less control over their work environment, limited access to safe housing in healthy communities, and fewer resources to resist or cope with health and environmental threats.

A powerful tool for evaluating the environmental impact of individuals, cities, and countries is the "ecological footprint" (Wackernagel, 1996, p. xi). The results of this analysis, the ecological footprint for person, city or country, allows for simple comparisons and a clear entry point into the inequality and unsustainability of current patterns of industrial growth. An ecological footprint corresponds to the amount of nature they occupy to keep them going (i.e., the land required to continuously provide their resource supplies, and absorb their wastes, using prevailing technology). One can calculate an ecological footprint or how much land each person uses based on population, productive land and resource use. Approximately two hectares per capita of biologically productive area exists on our planet, but as 12 percent should be preserved for biodiversity leaves only 1.7 hectares per capita are available for human use (Redefining Progress). These 1.7 hectares become the ecological benchmark figure for comparing people's ecological footprints. Canadian's ecological footprint is much larger than other people's at 8.85 global ha/person, which translates into 4.7 Earths if everyone's footprint was Canada's footprint (Redefining Progress). Daily, Canadians generate 1.7 kilograms of waste per person as opposed to 0.8 kilograms per person in Sweden. These calculations reveals the extent to which affluent people and countries have already taken "more than their fair share" of life essentials, such as energy, arable land, and water. There are not enough resources worldwide for everyone to seek similar levels of resource consumption as Canadians; therefore, responsibility to control over-consumption rests with those who have appropriated more than is equitable. In Bangladesh and India the ecological footprint per person is much lower at 0.5 hectares/person and in China it is 1.2 hectares/person (Redefining Progress).

The richest fifth of the world compared to the poorest fifth consume or use 45 percent of the world's meat and fish in comparison to 5 percent; 58 percent of the total energy compared to **4** percent; 84 percent of all paper compared to 1.1 percent; and 87 percent of the world's vehicles. Global poverty is not a matter of lack of resources but a consequence of economic control by the rich countries (the systemic discrimination of economic policies and corporate practices set out through the World Trade Organization, GATT, the G8, etc.) (Redefining Progress). How this came about remains a story largely untold in schools. The intrinsic characteristic of colonialism was the winner owned everything it "discovered" or conquered (Churchill, 1998). Thus, all property titles, including land and water, stemmed from the Crown because everything belonged to the sovereign as discoverer. This was a global feature of colonialism. In the colonial period, European military power and later (continuing to the present) through indebtedness, the colonizers took the treasures of forests and croplands, minerals, artifacts and the finest ornaments of ancient civilizations.

Since most countries do not have dominion over any colonies from which wealth may be squeezed, they place intolerable pressure on their own people and environment to recreate this model of development. The rights of minorities are violated, the resource-base of forest people and subsistence farmers plundered to earn foreign exchange, the labour of the poor sold to the lowest bidder, "surplus population" is encouraged to settle and farm ancestral homelands of tribal and indigenous peoples. The International Monetary Fund and World Bank provide loans to these countries to develop resources for foreign exchange resulting in the debt crisis. Although experiencing a crisis of hunger and HIV/AIDS, Malawi which owes $2.9 billion, is still expected to pay $66 million a year, mainly to the rich countries, the IMF and World Bank (March of Women, n.d.). Similarly, in Tanzania, where people's yearly income is US$140 and one child in ten dies before

the age of one, every resident owes over US$250 in foreign debt. Debt servicing costs are higher than money spent on health care. In Nigeria $3,375 million US$ was spent on debt servicing, while only $960 million was available for health care in 1990 (March of Women, n.d.). In 1998, the United Nations and the World Bank estimated that US$225 billion per year would be needed to eliminate extreme poverty and furnish adequate environmental protection, which is less than the global tax evasion by the rich that is estimated at over US$292 billion per year.

The green revolution and new biotechnologies are a political process that shifts control over biological diversity from local people to transnational corporations. The green revolution began soon after World War II in the First World when energy, chemical, water, and capital intensive agricultural technologies were heavily promoted and subsidized. The green revolution was pushed on Third World countries through loans from international development agencies and heralded as a way to develop out of poverty (Shiva, 1997). The industrial revolution, the green revolution and the emerging gene revolution have converted recycling, self-renewing agriculturally productive ecosystems into a production line with raw materials and chemicals as inputs and with commodities and pollutants as outputs. Technology changes biological systems from complete systems reproducing themselves into raw material that can be patented, owned, and produced by the seed company (rather than reproduce itself). The myth that chemicals and machines can replace the life in food and the life of the soil, usurp the productive role of Aboriginals and peasants in sustenance activities

Although most discussions of inequity are between developing and developed countries, the two are really nested within each other such that the developing world exists within the First world—in poor communities that include many Aboriginal communities and the first world even in the poorest of countries. To deepen this dialogue, Cree author and founding president of the World Council of Indigenous Peoples, George Manuel, introduced the term "Fourth World in 1974. "The 4^{th} World is the name given to indigenous people descended from a country's Aboriginal population and who today are completely or partly deprived of their own territory and its riches. The peoples of the 4^{th} World have only limited influence or none at all in the nation state [in which they are now encapsulated]" (qtd. in Churchhill, 1999, p. 372). Ward Churchill (1994) writes about Eurocentric thinking motivating the national project of "clearing" Aboriginals. Aboriginals, in the 1900s, lost 98 percent of their population and 97.5 percent of their land base when placed on reserves under the power of the federal government in Canada and the US:

> US policymakers had adopted a popular philosophy called "Manifest Destiny" by which they imagined themselves enjoying a divinely ordained right to possess all native property…. This was coupled to what has been termed a "rhetoric of extermination" by which governmental and corporate leaders sought to shape public sentiment to embrace the eradication of American Indians. The professed goal of this physical reduction of "inferior" indigenous populations was to open up land for "superior" Euroamerican "pioneers." One outcome of this dual articulation was a series of general massacres perpetrated by the United States military…. Even worse in some ways was the unleashing of Euroamerican civilians to kill Indians at whim, and sometimes for profit. In Texas, for example, an official bounty on native scalps—any native scalps—was maintained until well into the 1870s. The

> result was that the indigenous population of this state, once the densest in all of North America, had been reduced to near zero by 1880. (p. 36)

Many Aboriginal authors see the roots of some of Hitler's policies and of South African apartheid, in policies, like the reserve system, that were applied by European settlers to Aboriginals (Churchill, 1999; 1998; 1994). That sustainability in a world with limited resources is not compatible with the existing profit—and growth—oriented development paradigm was already clear to Mahatma Gandhi 70 years ago. When Ghandi was asked by a British journalist whether he would like India to have the same standard of living as Britain, he replied: "To have its standard of living a tiny country like Britain had to exploit half the globe. How many globes will India need to exploit to have the same standard of living?" (qtd. in Zachariah, 1986, p. 97). Ghandi saw education as the basis for a village to become self sufficient in grain, vegetables, fruit and productive crafts linked with the immediate environment, by emphasising the natural and the social environment of the student and village (Ravindranath and Iyer-Raniga, 2000). He called this concept of education Nai talim or "new education" where the head, heart and hands are trained to work in co-ordination, replacing the book-centred education that was the legacy of the British Empire (Ravindranath and Iyer-Raniga, 2000). Gandhi hoped that this form of education would help bridge the gap between the village and the city, reflecting Indian ideals of self-reliance, a clean and hygienic environment, the protection of nature and careful use of natural resources. Its base is in the principles of equality, liberty, human fellowship and peace (Ravindranath and Iyer-Raniga, 2000).

Last Thoughts

Environmental justice is a deep well that provides plenty for all to drink from. An environmental justice framework in environmental education raises questions about the equity of resource distribution, of ways of knowing and of environmental health. This is movement towards a sustainable future, linking environment and development education. I see it as the next step in environmental education to move towards sustainability for all—starting in our communities in solidarity with others around the world, as environmental equity issues are both local and global. This evolution of education involves environmental justice, environmental health and traditional ecological knowledge.

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