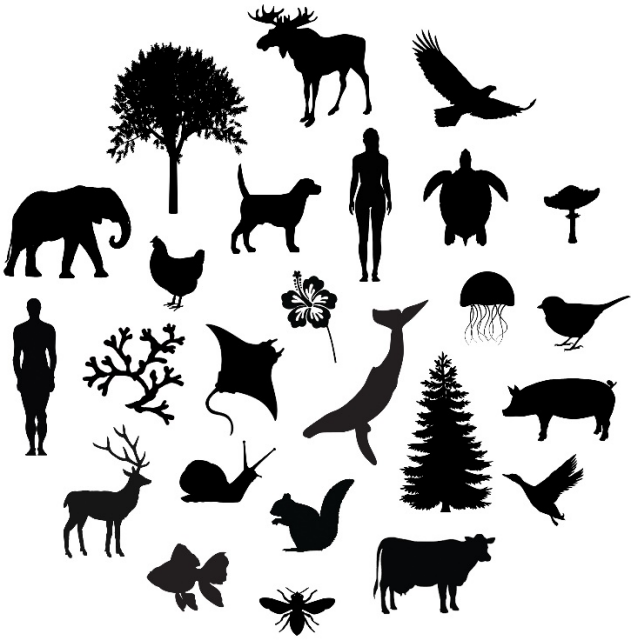
Reclaiming Ecological Wisdom

On Culture, Education, and the Roots of the Ecological Crisis



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Abstract

The paper looks at the global ecological crisis as a human crisis of perceptions and values. Its origins can be found in the Western anthropocentric-individualistic worldview whose expansion through the processes of colonization and globalization has allowed the industrial culture to become a global culture. The manifest inability of industrial societies to respond to the seriousness and complexity of environmental degradation they cause imposes us to consider strategies for change that go beyond the political, economic, and technological realms and address sustainability in its cultural dimensions. The ecological crisis is a crisis in the way people in the dominant industrial consumer culture have learned to think and thus to behave in relation to larger living systems and toward each other. Inspired by the existing literature surrounding the fields of human ecology, environmental philosophy, and philosophy of education, the paper analyses the ecological implications of modern Western worldview and how it legitimizes exploitative human-environmental relationships. Then, it proposes a work of reconceptualization of the contents and practices of education on ecological perspectives which can help develop citizens who are able and willing to build diverse and sustainable human communities and can further advance the transition towards a more balanced and harmonious human-Earth relationship.

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Table of Contents

INTRODUCTION

The time has come to lower our voices, to cease imposing our mechanistic patterns on the biological processes of the earth, to resist the impulse to control, to command, to force, to oppress, and to begin quite humbly to follow the guidance of the larger community on which all life depends.

Thomas Berry

When we try to pick out anything by itself, we find it hitched to everything else in the universe.

John Muir

After nearly six decades of growing emphasis on environmental awareness, upheld by activists, media, writers and poets, scientific researchers, and international organizations, we can affirm with certainty that the environmental degradation caused by human actions is not the result of ignorance. Let me clarify; many people act in their everyday life in ways that they do not consider the consequences of their actions. This is the essence of the consumer lifestyle. But the reality is not that we do not know what happens. We do, but this knowledge does not seem to be enough to change the way we live. Rather, the paradox is that the more we seem to know about environmental problems, the more we keep doing the same. Despite the almost general consensus within the scientific community about the anthropogenic causes of global climate change and the twenty-five-years-old-call for an urgent reduction of greenhouse-gases emission, the concentration of CO_2 in the atmosphere has never been so high (IPCC 2014). The association 'increased amount of information/increased environmental impact' can actually be extended to all the events we are witnessing, from species extinction to resource exhaustion, from ocean acidification to soil loss, from air and water pollution to toxic contamination. But if it seems difficult to link how our individual behavior directly impacts the life of ecosystems or other human communities, the consequences of our collective actions as industrial societies are before our eyes.

The 'inconvenient truth' is that we are undermining the ecological context that sustains human life. At the current rate of resource use, if everybody on earth consumed as the average Westerner, we would need 3 more planets to exploit. Yet, the Western model of consumer lifestyle is held as a sign of progress and is sold to 'underdeveloped' and 'developing' countries as the goal to achieve, the source of well-being. The global rush for endless growth and

development is condemning future generations to even greater disasters, given the fact that we are exhausting resources that will never be available to them and we are interfering with natural cycles in ways that ecosystems can no longer compensate. If generations yet to come are paying the price of our 'wealth', then where is the progress?

This research looks at the ecological crisis as a reflection of a human crisis of perceptions and values. In this view, describing the crisis as *ecological* is more appropriate than using the term *environmental*. Although in academic and public debates the terms are used interchangeably, they carry different meanings. The crisis that manifests in various forms of environmental degradation is not a crisis *of* the environment. Even if we acknowledge that its origins are human, defining the crisis as environmental emphasizes that the problems are 'out there' in nature, and there need to be fixed. Of course it is a problem if glaciers are melting and fisheries are being depleted, but they are not the cause of the crisis – they are consequences of it. On the contrary, the term 'ecological' does not point to the environment alone, but puts emphasis on the interrelations among human and natural systems. The crisis is ecological because its causes lie in the way we are relating to the environment. It is a *crisis of relationships*, that is, a human crisis.

Challenging the dominant narrative that frames the solutions to the crisis in terms of more efficient implementation of science and technology, and refusing the colonizing generalization that the blame for our plight should be ascribed to a supposed 'natural' human selfishness or greed, this research addresses the cultural roots of the ecological crisis. The seriousness of the ecological emergency we are facing cannot be reduced to mere economic and political factors, but unveils a deeper ethical and spiritual crisis. The predatory relationship of domination and exploitation that industrial consumer societies hold with the environment reveals a fundamental problem of adaptation to the earth and to the limits of other forms of life. The failure of the dominant anthropocentric industrial culture to recognize human dependence on and embodiment in larger living systems, and the arrogance with which such dependency is systematically denied, is the symptom of a misunderstanding of the place that human beings occupy in the web of relationships that sustains all kinds of life. This work argues that the destructive impact of the industrial consumer culture on the environment, far from being the 'inevitable' price of progress, derives in the first instance from a way of perceiving and relating to the world that considers humans as being separated from and superior to an objectified nature which, deprived of any inherent purpose or value, can then be

managed and exploited for human interests. The manifest inability of our political and economic institutions to respond to the worsening of environmental deterioration imposes us to consider that the way in which the crisis is being addressed – how problems are understood and solution proposed – may be flawed at its heart.

Looking at the ecological crisis as a crisis of culture allows for the recognition of the cultural dimensions of sustainability. Marking a contrast with materialistic and deterministic ways of addressing environmental issues, which find explanations and strategies for change almost exclusively in the economic field, the focus on culture here proposed identifies the fundamental problems of sustainability as being not primarily technological (information, materials, energy), but rather concerning values, attitudes, and perceptions. As Plumwood (2002) maintained, the achievement of sustainability is not merely a matter of efficiency in energy and materials – if we used a fraction of the fossil fuels currently available to build hyper-efficient solar-powered machines that continue to exploit what is left in the forests, oceans, and soil, the biosphere could still be seriously degraded. This is to say that, if there is no deeper recognition of limits and dependency on healthy ecosystems, more efficient technologies can be used to destroy nature more efficiently, to expand its commodification, and to ensure that an ever-increasing part of the world population takes part in the consumerist economy. Greater material efficiency and cleaner energy sources, as technical fixes, "can stretch ecological limits, but [they are not] a substitute of the cultural process of recognizing those limits, nor will [they] necessarily contribute to that process" (Plumwood 2002: 7). A change in human-environmental relationships will only be effective if accompanied by a profound change in the perception of these relationships which must go beyond the pure rational self-interest. The choice before us is between reaffirm the illusion that we can indefinitely manage the environment to fit our wants, or opening ourselves to the recognition that the separation between humans and nature is just an assumption, an idea that must be overcome. We need to redefine our purposes in accordance to our ecological existence.

Reclaiming ecological wisdom points to the possibilities we have to develop a culture that values and acknowledges human interconnectedness with the rest of nature and is able to guide human actions in the light of this awareness. The proposal presented in this research is that of rethinking education on ecological perspectives as a way to foster the deep cultural change we need. It moves from the consideration that the knowledge and competence

necessary to live sustainably do not have to be invented nor discovered – they are available to us as they are embodied in the wisdom of human cultures and traditions that have developed an intimate connection to the land under the recognition that they are part of a larger material and spiritual order. Reclaiming ecological wisdom through rethinking education does not mean to borrow or reproduce the teachings of those cultures, but *to learn* what is valuable to us by acknowledging their relevance and immeasurable worth in a time in which modern Western values do no longer offer certainties. With the same attitude, we can see that most of what we need for creating sustainable human communities can be learned from how nature sustains life in ecosystems, which are communities of organisms sustainable by definition. An ecological education will play a crucial role in preparing responsible citizens who truly care about preserving life and are able to apply their ecological understanding to the re-design of our technologies and institutions, so as to truly adapt human communities to the ecologically sustainable systems of nature. As Fritjof Capra points out, the survival of humanity will depend on our ability to recover ecological wisdom, on understanding the basic principles of ecology and to live accordingly.

PART I: CONTEXTUALIZING THE RESEARCH

1.1 Rationale behind the study

The very aim of this research, expressed in broad terms, is to propose a work of reconceptualization of the contents and practices of education on ecological basis which can contribute to a shift toward a socially and ecologically just living and can further advance the transition towards a more balanced and harmonious human-Earth relationship.

The point of departure and the rationale for engaging in this effort can be summarized in a number of interrelated assumptions.

First, the acknowledgement that the contemporary crisis that manifest itself in the environmental, social, and financial sphere can be understood as a crisis of perceptions and values. Gregory Bateson, in a document written in 1970 titled *The Roots of Ecological*

Crisis[1], ascribed the causes of environmental degradation to the combined action of three factors: (*a*) technological advance; (*b*) population increase; and (*c*) established ideas about the nature of humans and their relation to the environment. Bateson showed the connections between these three causes and explained how they interact and nourish each other. However, I think that the third one (*c*) is worth to look closer at. If "established ideas about the nature of humans and their relation to the environment" is one of the main causes of environmental degradation, a serious discussion about the transition towards sustainability cannot disregard considering the conditions which make a change of ideas possible, and therefore analyzing the role of education in promoting the ecological wisdom and competence necessary to live sustainably.

Second, the fact that, under the pressures of economic globalization, Western industrial culture is becoming a global culture. For Vandana Shiva (1993), the expansion of the industrial way of living is accompanied by the imposition of a *monoculture of mind* that views Western systems of knowledge as universal. Very much like agricultural monocultures lead to the destruction of biological diversity, industrial culture is undermining cultural diversity by colonizing local knowledge. According to Hensley (2011), the individualistic-anthropocentric-industrial mindset is not just compromising the ecological integrity of the planet, but, by diminishing cultural diversity, it is undermining the human capacity to understand and respond to the ecological crisis.

Third, the fact that, tied to the recipes of economic development promoted by international financial institutions, current models of education in Western countries, more sensible to the formation of a specialized workforce for the global market rather than to the task of preparing students for the ecological challenges that humanity is facing, are being adopted worldwide (Prakash and Esteva 1998) and this trend is clearly inherently unsustainable.

Fourth, the acknowledgement that the urgency of reducing the impact of industrial societies on natural systems makes it imperative for societies and people all over the world to engage in dramatic changes in values and ideas as well as in lifestyles and habits of behavior. In this perspective, we can understand that, if education has to play a central role in stimulating young generations towards different relationships with the environment, its contents, forms,

1 In *Steps to an Ecology of Mind.* 1973. St. Albans: Paladin (pp. 464-469)

and purposes have to be thought with a special commitment for creating responsible individuals and human communities capable to engage in radical behavioral changes. Learning to live in harmony with larger living systems will require dramatic changes in the current Western modes of thinking.

Fifth, the tenet that the real challenge for an educational model founded on ecological basis is that this model should contain a clear conceptual framework and a systematic methodological basis (strategies) for targeting changes in perspectives, values, and practices as main priority (Orr 1992). As claimed by Hensley, rethinking education on ecological basis means to overcome the industrial paradigm "which positions the value of economic development over ecological vitality" (2011:16). As highlighted by Martusewicz, Edmundson, and Lupinacci (2011), in order to begin educating ourselves and the future generations about how to live differently on the Earth it is imperative to stop reproducing a culture that reinforces ethics and assumptions that lead to socially and ecologically destructive practices, such as domination and commodification of nature, infinite economic growth, consumerism, human and environmental degradation and exploitation.

These are the standpoints from which I assume that an analysis of modern Western worldview and its ecological implications is necessary to a thorough understanding of the current crisis. Similarly, the task of rethinking education on ecological basis is here advanced as an indispensable tool with which to foster a change in perspective, values, and ways of living that can support a sustainable human relationship with the Earth.

1.2 Aim and research questions

Based on these grounds, the overall purpose of this research is to develop ideas (put forward contents and modes of thinking and learning) that can be interesting for and adopted by educational curricula based on ecological values.

This aim will be accomplished through two main ways:

I. Address the cultural dimensions of the ecological crisis by analyzing the ways modern Western worldview and epistemology frame the kind of human-environmental relationships characteristic of the industrial consumer societies. More specifically, try to examine from an ecological perspective the main philosophical and epistemological

assumptions that underlie such relationships, and the ways in which they are constructed through culturally specific modes of thinking.

II. Advance the cultural shift towards ecological perspectives by identifying and developing contents and practices in education that can contribute to a sustainable lifestyle and to the construction of just, diverse, and responsible communities. This task will be carried out through the discussion of existing educational approaches grounded on an ecological worldview.

The study seeks to answer three key questions:

- What are the cultural origins of the instrumental and exploitative relationship with the natural world characteristic of the industrial consumer societies?

- How can an education based on ecological perspectives foster a change in values and behaviors?

- What role can an ecological education play in the construction of diverse and sustainable communities?

1.3 Approach and methodology

This thesis is a literature study and is not based on the collection of empirical data or field work analysis. The central theme – a reconceptualization of education on ecological values - is developed primarily from a review of the current body of literature that surrounds the field of sustainability and education and draws mainly from the fields of human ecology, environmental philosophy and philosophy of education.

Organized in the form of a philosophical discussion, the research addresses the relations between education and sustainability - between the contents and processes of education and the lifestyle it promotes and prepares for.

The scope of analysis of this study is not the educational systems in themselves, enterprise that would require to examine the methods and processes of teaching and learning that take

place from lower to higher levels within schools, colleges, and universities. Rather, formal education is here considered in its entirety as one of the primary means with which societies foster the process of learning and cultural transmission (Delle Fave et al. 2011). Attention is put on what educational systems are designated to transmit, that is *culture.* More specifically, focus of the analysis are the ecological repercussions of modern Western way of thinking and perceiving the world (worldview). Through an ecojustice framework (Bowers 2001) I will use a 'cultural ecological analysis' (Martusewicz et al. 2011) to discuss the dominant cultural assumptions and values that underlie the predatory relationship of domination that industrial consumer societies hold with the environment.

Moving from the consideration of the role played by Western educational institutions in sustaining the capitalist economy, a model of development predicated on consumerism and infinite economic growth, and the underlying systems of values (Marcuse 1964; Illich 1971; Bourdieu and Passeron 1990; Braudillard 1998), this research reflects upon the ecological consequences of socializing students into the norms and values of the industrial consumer society. If, as it will be argued, the acceptance and worsening of environmental degradation is attributable to cultural modes of thinking, then, as Orr (1992) first noted, the ecological crisis reflects a crisis in education.

The model of education which is critically addressed in this research is one mainly characterized by: the use of rationality as the only valuable source of knowledge; a view of the individual as the basic and autonomous social unit; a linear and progressive idea of change and time, and an anthropocentric and mechanistic worldview (Merchant 1983, Bowers 2001, Plumwood 2002). As used in this work, the concept of 'dominant' or 'global' model of education refers to the one that, relayed by the process of rapidly increasing globalization from the 20th century onwards, has adopted the Western industrial consumer paradigm and its underlying values. Set to increase social efficiency (Hensley 2011), the dominant model of education is oriented to advance economic prosperity and other pre-determined indicators of success for today's human societies with no regards for future generations and other living beings.

The critique of this model is grounded in understanding the ecological consequences of mindlessly reproducing the thinking, consumption habits, and attitudes towards nature that are largely responsible for perpetuating the ecological crisis that we are facing. Through this

approach, attention is put on the values and the fundamental assumptions about reality that underlie Western worldview and that the curricula of a market-oriented model of education contribute to reproduce. It is maintained that the knowledge taught via educational institutions, framed strictly and exclusively within rationalist scientific thinking, reproduces culturally specific (Western) ways of thinking and human-Earth relationships. In other words, the way in which the content and the process of modern day education in organized is not neutral, but has serious ecological implications.

1.4 Structure

The research is divided into four parts:

Part I introduces the research problem and the rationale which defines its formulation. Aim, research questions, approach, and methodology are presented.

Part II situates the study in the context of the ecological perspective in relation to the research issues. It is illustrated through a series of contributions of different theories and authors in order to define the theoretical standpoints and concepts adopted in the research. Among the most influential, deep ecology, ecofeminism, ecojustice, and the work of Gregory Bateson provide the framework for the development of the following parts. More specifically, the ideas chosen to describe the ecological perspective constitute the groundwork for the analysis of Part III.

Part III addresses the cultural roots of the ecological crisis by considering the ecological implications of modern Western way of thinking and perceiving the world (worldview). A cultural ecological analysis will be carried out to discuss how the exploitative relationship with the environment held by industrial consumer societies derives from taken-for-granted beliefs about the nature of humans and their place in the world which are reproduced and rationalized by hierarchical and dualistic modes of thinking and a logic of domination. The 'epistemological errors' of Western thought are deconstructed from an ecological perspective. Part III concludes with a list of significant ideas for an ecological understanding of human-environmental relationships which can help overcome unsustainable assumption and recover ecological wisdom. These ideas represent the conceptual basis for the development of Part IV.

Part IV sets forth a reconceptualization of education on ecological perspectives as a necessary condition for a transition to a sustainable living. Three complementary educational approaches are presented: ecological literacy; place-based education; and education for the commons. Part IV explores a way (education) through which the cultural dimension of the ecological crisis can be addressed and practices for the construction of human sustainable communities implemented.

PART II: THE ECOLOGICAL PERSPECTIVE

2.1 Theoretical standpoints

The study finds its place in and takes inspiration from the paradigm shift which is gradually and transversally investing the Western scientific community, and contemporary societies overall. This shift is characterized by a profound change in perspectives from which reality is studied and demands a reformulation of the dominant assumptions and beliefs which lie at the core of Western scientific tradition (Capra 1996, 2002). Among the changes that such a paradigm shift entails on both ontological and epistemological levels, the one guiding this research is the recognition that humans are not separate from the rest of nature. Such awareness is becoming increasingly evident as the worsening of environmental degradation is reveling how human well-being is fundamentally nested in the well-being of larger living ecosystems. The theoretical framework of this research is indeed grounded on an ecological perspective that views human and non-human beings, cultural and natural systems as interconnected and interdependent parts of a larger whole we call planet Earth. In the light of the unprecedented rate of environmental destruction and the need of shifting towards truly sustainable ways of living, I align with those perspectives, within and outside the scientific community, that recognize the epistemological limits and the environmental consequences of an anthropocentric and mechanistic worldview, and call for a radical paradigm shift toward more eco/bio-centric perspectives. Among the different philosophical traditions that embrace an ecological worldview, the most influential in the development of this work are *deep ecology* and *ecofeminism*.

Deep ecology's core principle is the belief that all begins have inherent value regardless their utilitarian benefits for human ends. It takes a holistic view of the world according to which

human beings form part of and are dependent on the subtle balance of complex interrelationships that is nature. Deep ecology advocates for a radical reorganization of modern human societies in accordance to these principles. Its strong emphasis on action makes of deep ecology a movement which provides a new system of environmental ethics focused primarily on wilderness preservation, human population control, and simple living. Central works in the formulation of deep ecology's vision and principles are Arne Næss' *The Shallow and the Deep, Long-Range Ecology Movement* (1973); Bill Devall and George Sessions' *Deep Ecology* (1985); and Warwick Fox's *Toward a Transpersonal Ecology: Developing New Foundations for Environmentalism* (1990).

Ecofeminism refers to the variety of feminist perspectives on the nature of the connections between the domination of women (and other oppressed humans) and the domination of nature (Warren 1996). It argues that hierarchical classifications in general, like anthropocentrism, androcentrism, racism, sexism, speciesism, are all forms of discrimination that originate from a flawed system of values that should be abolished. Ecofeminist Val Plumwood (2002) links both social and ecological oppression to age-old patterns of thinking in Western culture characterized by value hierarchies, dualisms, centric thinking, and logic of domination. For a more complete overview of ecofeminist philosophy, I refer to Vandana Shiva's S*taying Alive: Women, Ecology and Development* (1988); Val Plumwood's *Feminism and the Mastery of Nature* (1993); and Karen J. Warren's *Ecofeminism: Women, Culture, Nature* (1997).

In embracing the interconnectedness of the living world, both deep ecology and ecofeminism advance a reconceptualization of the self beyond the dominant notion of abstract individualism. Human relationships with the environment and other non-human beings are seen not as separate or extrinsic to human identities but are integral part of the human self. The relevance of deep ecology and ecofeminism for this work lies in their consistent formulation of a different set of philosophical assumptions which challenges the validity of the anthropocentric worldview that constitutes the basis of scientific epistemology and still prevails within Western philosophy. Looking at reality from an ecological perspective, they highlight, on one hand, the epistemological limitations of the autonomous and objective scientific rationality detached from its object of study; on the other, they focus attention on the deep-rooted cultural assumptions that legitimize an exploitative and instrumental human-environmental relation that needs to be overcome.

From an epistemological point of view, it is maintained that human relations with the natural environment are profoundly conditioned by the worldview proper of each culture: more specifically, that culture plays a fundamental role in determining people's beliefs, attitudes and relations toward each other and the environment. In this sense, the present research draws from constructivist theories of knowledge that argue that the knowledge that is produced and transmitted about human systems, the natural world, and the interactions between them is culturally specific and socially constructed. The ways to look at the world and to give meaning to it are therefore multiple and different, and every culture builds, maintains, transmits and, occasionally, changes its social world and its perceptions of nature according to its own intellectual heritage. It is from this standpoint that the crisis in human relations with the environment is here considered as the direct reflection of a cultural crisis – a crisis of beliefs, perceptions, and values.

Studies in cultural psychology have demonstrated that there exists a dialectical relationship between beliefs and behaviors – on both individual and group levels - and that both influence each other (Bruner 1990). In this relation of mutual influence, beliefs condition behaviors, and social practices reinforce, and eventually change, established ideas. However, the theoretical standpoint assumed in this research focuses on the importance of understanding how our deeply rooted assumption and beliefs frame our interactions with the world. Whether our versions of reality are more determined by our beliefs or the social relationships in which we engage, our views about nature, about the importance of the individual, and about the impact of technological advancement and industrialization are culturally transmitted and constructed by our intellectual heritage (Winter 1996).

2.2 Ecojustice theory

In adopting an ecological perspective in the exploration of an alternative approach to education, this research draws primarily, although not exclusively, on the theory (or philosophy) of *ecojustice*, as elaborated by Chet A. Bowers (1997, 2001, 2003).

Ecojustice is an ecological perspective that addresses the confluence of social and environmental injustice, oppression for humans and nature, and ecological degradation (Bowers 2001; Mueller 2008; Martusewicz et al. 2011). The central concern of ecojustice is understanding the tensions between human cultures (i.e. intergenerational knowledges and

skills, beliefs and values, narratives and epistemologies) and the needs of the Earth's ecosystems (Mueller 2009). In doing so, it focuses on cultures from an ecological perspective – it looks at how different systems of beliefs, values, and the attached norms of behavior and practices interact with the larger living natural systems within which humans and their cultures are nested. Therefore, ecojustice addresses social justice issues of class, race, gender within a more comprehensive framework that includes ecological well-being, environmental issues, moral consideration of species other than humans, the recognition of the significance of preserving the cultural and environmental commons and the role it plays in maintaining the ecological integrity of the planet (Mitchell and Mueller 2011).

The theory of ecojustice was formulated as a reflection on the connections between educational theory and social justice theory, and from a strong critique of those educational reforms which ignore the profound convergence of social and ecological justice (Bowers 2001). Ecojustice's most fundamental element is the insight that every proposal for educational reform needs to be set within the framework of sustainability and must address the cultural dimensions of the ecological crisis. By embracing an ecological worldview, ecojustice challenges what are defined as the modern myths of Western culture – anthropocentrism, individualism, linear view of progress – and criticizes many educational reforms (in North America) that contribute to strengthening ecologically problematic cultural assumptions.

In elaborating ecojustice theory, Bowers is influenced by many environmental and educational philosophers. Within environmental philosophy, important contributions come from environmental ethicists (e.g. Peter Singer, J. Baird Callicott, Wendell Berry, and Aldo Leopold), deep ecologists (e.g. Arne Naess, George Sessions, and Warwik Fox), ecofeminists (Karen Warren, Carolyn Merchant, and Vandana Shiva), and social ecologists (John Clark and Gary Snyder). Among educational philosophers, the writings of Ivan Illich, Mahdu Suri Prakash, Gustavo Esteva, and Helena Norberg-Hodge have been particularly influential.

Martusewicz, Edmundson, and Lupinacci (2011: 9-10) offer the following six interrelated elements to define ecojustice:

- **Cultural ecological analysis.** The recognition and analysis of the deep cultural assumptions underlying modern thinking that undermine local and global ecosystems

essential to life.

- **Addressing the causes of eco-racism.** The recognition and analysis of deeply entrenched patterns of domination that unjustly define people of color, women, the poor, and other groups of humans as well as the natural world as inferior and thus less worthy of life.
- **Addressing the dangers of cultural and economic globalization.** An analysis of the globalization of modernist thinking and the associated patterns of hyper-consumption and commodification that have led to the exploitation of the Southern Hemisphere by the North for natural and human resources.
- **Revitalizing the commons.** The recognition and protection of diverse cultural and environmental commons – the necessary interdependent relationship of humans with the land, air, water, and other species with whom we share this planet, and the intergenerational practices and relationships among diverse groups of people that do not require the exchange of money as the primary motivation and generally result in mutual aid and support.
- **An emphasis on strong Earth democracies**. The idea that decisions should be taken by the people who are most affected by them. These decisions must include consideration of the well-being of future generations and the right of the natural world to regenerate and flourish regardless its instrumental value for human benefit.
- **Educational reform.** An approach to pedagogy and curriculum development that emphasize both deep cultural analysis and community-based learning encouraging students to identify the causes and remediate the effects of social and ecological violence in the places where they live.

The first five points represent the most significant aspects of ecojustice philosophy that are offered as the guidelines with which to frame an educational reform. Bowers and Martusewicz argue that ecojustice is a pedagogical approach that provides a framework for bringing into view social practices and traditions, languages, and relationships with the land necessary to the sustainability of human communities (in Kulnieks, Longboat, and Young 2013: 10-11). The focus of an ecojustice approach to educational reform is connected with the need to reduce the impact of the industrial/consumer-dependent culture on everyday life while at the same time ensuring that people are not impoverished and limited in terms of equal opportunity. On a practical level, as Bowers (2001) succinctly puts it, ecojustice implies

living within the carrying capacity of the Earth and in a manner that is socially just towards humans and non-humans living now and in the future.

Central to ecojustice philosophy and education is the conservation, restoration, and revitalization of the *commons*. For Bowers (2006a, 2006b) the commons are represented by the Earth's natural systems, including air, water, soil, forests, oceans and others, and diverse cultural systems, including intergenerational knowledge, languages, ceremonies, arts, crafts, that are shared without cost and have not yet been privatized or commodified. Ecojustice scholars recognize that conserving and renewing the commons is essential to live within ecological limits in a socially just way towards present and future generations. While natural and cultural commons are equally indispensable to sustain human communities, ecojustice emphasizes the importance of protecting and revitalizing the cultural commons as an alternative to the industrial consumer lifestyle which is seen as the primary cause of the increasing enclosure and destruction of the world's diverse commons. It is acknowledged that necessary actions for protecting natural commons are powerless if human (cultural) destructive habits – and the system of believes and values from which they originate – are not addressed. To put it alternatively, by conserving cultural diversity and sustaining the human relationships of the cultural commons (and by reducing our dependence on industry and consumerism), we contribute to sustain the plants, animals, air, water, and soil of the environmental commons (Bowers 2004; in Mueller 2008).

Fundamental to Bowers' writings on the commons is the concept of *conservatism*. Bowers (2001, 2003) explains how the current political use of the labels 'liberal' and 'conservative' is largely paradoxical. For instance, it is assumed that those who promote private enterprise or support capitalism and corporate business are conservative while those who are more concerned with achieving equal social well-being are liberal. These definitions are utter nonsensical particularly when considering that the reactionary efforts of the mislabeled conservative are founded on the ideology of perpetual change and progress which are cause of environmental degradation and community disintegration. Drawing attention on the modern abuse and misrepresentation of the term conservatism, Bowers therefore highlights the need of overcoming the limitation of the current political discourse by adopting a wiser and more penetrating approach. He argues: “What is being conserved needs to be continually reassessed in terms of whether it contributes to community self-sufficiency and thus to a smaller ecological footprint” (2003: 26).He proposes the adoption of what he calls *cultural/bio*

conservatism (1996; 2001) or *mindful conservatism* (2003) – a non-anthropocentric form of conservatism, embodied by hundreds of indigenous cultures, based on the awareness that the survival of human societies depends on the viability of natural systems and which is expressed by ecologically sustainable patterns of living. Its guiding principle could be found in the words of Aldo Leopold's declaration that "a thing is right when it tends to *preserve* the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise" (1966: 262; in Bowers 1996: 8; italics added). Mindful conservatism starts from asking: what do we need to conserve in order to achieve a socially and ecologically sustainable future? The question points out clearly the need of distinguishing between oppressive and community-sustaining traditions as well as between empowering and destructive changes and innovations (Jucker 2003). Ecojustice scholars note that, while commons practices are highly valued by ecojustice education for their role in sustaining communities, they may also be oppressive or harmful toward the environment and should therefore be changed without increasing human ecological impact (Mueller 2009). To reiterate, conservation/change decisions advocated by ecojustice must be taken within the framework of sustainability, that is, when they strengthen community self-reliance against the dependency on consumerism in a manner that is socially just towards humans and non-humans living now and in the future.

Central to ecojustice is the notion that language and cultural knowledge carry forward particular metaphors and deemphasizes or ignores others, which influence human relationships with the Earth's natural environment. Such metaphors – like 'the universe is a machine' or 'reason is knowledge' - work as deeply ingrained taken-for-granted assumptions and beliefs which play a central role in shaping cultural perceptions and interpretations of reality. These *root metaphors* encode and reproduce cultural ways of knowing (narratives) and thus lead to those behaviors that best accord to the cultural perceptions. This assumption has been influenced by the works of Peter Berger, Thomas Luckmann, Alfred Shultz, Gregory Bateson, Friedrich Nietzsche, Michel Foucault, Edward Shils, Vandana Shiva, and Helena Norberg-Hodge. These authors argue that culture plays the strongest role in people's thinking patterns, attitudes, and relation with each other and the Earth (Mueller 2009). Consequently, socially and ecologically destructive ways of living stem from culturally specific assumptions and perceptions about the nature and role of humans in relation to larger life systems and toward others. From an ecojustice perspective, the ecological crisis mirrors a deep human crisis and can only be addressed through an analysis of its cultural roots.

2.3 The ecological mind

The concept of 'ecological mind' – or, more precisely, of 'ecology of mind' – is notoriously referred to the work of English biologist and anthropologist Gregory Bateson, which has probably been the most influential in Bowers' ecojustice philosophy. By focusing attention on the relationships between language, culture, and thought, and how these affect the sustainability of any culture in relation to the larger life systems they depend upon, the theory of the metaphorical nature of language and thought found in Bateson's work (1973, 1987) provides an understanding of how language[2] "creates culture, encodes our thought patterns and frames the way we will perceive, relate to, and act in the world" (Martusewicz et al. 2011: 56). Mediating between the world and our understanding of it, human discursive forms (linguistic, textual, and other symbolic codes) create "maps" which guide our perceptions and interpretations of the world. However, Bateson remarks that "the map is not the territory" (1973: 423-442; 1979: 30), meaning that, just as a road map leaves out much of the features of the territory it maps, specific assumptions, beliefs, and ways of thinking (symbolic/cultural maps) only reveal part of the world, and create particular interpretations of it. As Martusewicz et al. put it, "if our language maps tell us that humans are separate from nature, it becomes difficult or impossible for us to see our interdependence with the natural world. As a result, we may act in ways, and through beliefs, that harm it and thus ourselves" (2011: 55).

When cultural assumptions and beliefs are not recognized they largely dictate how new phenomena will be interpreted (Bowers 2002). In other words, if we are not aware of the system of beliefs and values that influences our interpretations and perceptions of reality, such system may be taken for granted and remains as part of what is passed along the cultural commons (Mueller 2008). In this respect, Bowers (2002) supports Nietzsche intuition that it is only possible to interpret new information within existing frames of reference; thus, this process of assimilation – the fitting of the new information into the old schema – reproduces the older conceptual patterns (Gardner 2004). Bowers (2009) maintains that the language and the basic assumptions of Western culture reproduce ideas that were formed before there was an awareness of environmental limits. Adopting an ecojustice approach, it is important to note that the recognition of human dependence on and embodiment in natural systems does not fit within old (but still dominant!) conceptual frameworks because it challenges the very basic

2 I borrow Martusewicz et al.'s definition of language as including "the symbols we depend upon, exchange and use for understanding, including body language and gestures as well as the spoken and written word, [and] the metaphors we internalize and then express" (2011: 56)

assumption of modern Western scientific thought that sees the human being as an autonomous separate Self living in a universe of Others, able to know and thus to control the objects/phenomena with which he interacts as a result of his separation from them.

Disputing the established human-centered notion of objective rationality that is separate from body or nature, Bateson (1973) uses the concept of *ecology of mind* "to explain the human relationship to other living systems as a living, communicating, and generative whole, all set within a limited Earthly context" (Martusewicz et al. 2011: 52). For Bateson, human embodiment in larger natural systems is not only physical – we depend on air, water, plants, animals, etc, for our subsistence – it is also the origin (the cause) of human intelligence. What we have learned to consider only as a result of human brain activity is rather the result of a collaborative endeavor among humans and the natural world. Human intelligence, or mind, is then only an integrated part of a larger ecological Mind - "a complex interactive system of communication and transformation where information is created and exchanged as various elements enter into relationship with each other" (Martusewicz et al. 2011: 52). This whole exchange of information – the ecology of mind – including our perception and interpretation of the world through the use of language, is at the heart of human interdependent relationship with the natural world (*ibid.*). Bateson writes:

> The individual mind is immanent but not only in the body. It is immanent also in the pathways and messages outside the body; and there is a larger Mind of which the individual mind is only a sub-system. This larger Mind is comparable to God and is perhaps what some people mean by 'God', but it is still immanent in the total interconnected social system and planetary ecology.
> Freudian psychology expanded the concept of mind inwards to include the whole communication system within the body – the autonomic, the habitual and the vast range of unconscious process. What I am saying expands mind outwards. And both of these changes reduce the scope of the conscious self. A certain humility becomes appropriate, tempered by the dignity or joy of being part of something much bigger. A part – if you will – of God.
> If you put God outside and set him vis-à-vis his creation and if you have the idea that you are created in his image, you will logically and naturally see yourself as outside and against the things around you. And as you arrogate all mind to yourself, you will see the world around you as mindless and therefore not entitled of moral or ethical consideration. The environment will seem to be yours to exploit. Your survival unit will be your folks or conspecifics against the environment of other social units, other races... (1973: 436)

Later on, he states: the organism which destroys its environment destroys itself[3] (459). Form both an evolutionary and ethical perspectives, Bateson changes the unit of biological survival from the organism (or the species, or the society) to the "organism-in-its-environment" (426), a fundamental unity that he equates with the unit of mind (423-481). What *thinks* and engages in 'trial and error' is not the organism alone but the total communicating system, which is the organism, its environment, and the interactions between them.

Bateson's viewpoint suggests us that "if we open ourselves to the recognition that intelligence is much bigger that our own minds or words, then we may begin to understand our specific dependence upon that which we currently treat as outside or 'Other'" (Martusewicz et al. 2011: 55). As alternative to the dominant form of individual intelligence, Bateson call for the cultivation of *systemic wisdom*, based on the recognition that human well-being depends upon understanding our dependence on, and participation in, a larger communicating and living system.

In a document written in 1970 titled *The Roots of Ecological Crisis*[4], Bateson ascribes the causes of environmental degradation to the combined action of (*a*) technological advance; (*b*) population increase; and (*c*) established ideas about the nature of humans and their relation to the environment. These three causes certainly interact and nourish each other, and each cause is in itself a self-promoting phenomenon[5]. He suggests then that the only conceivable reversal of this process would be a change in cultural attitudes toward the Earth, which implies, as Bowers puts it, "a radical transformation of the dominant patterns of thinking in the west" (2011: 13). Bateson talks about epistemological errors in Western thought that have a traceable history and date, in their most virulent form, from the Industrial Revolution. Such errors of epistemology are represented by the fundamental assumptions about the duality

3 This recognition is echoed by the famous words of scientist Carl Sagan who said: "A new consciousness is developing which sees the Earth as a single organism, and recognizes that an organism at war with itself is doomed" (from episode 10 'Who Speaks for the Earth?', *Cosmos: A Personal Voyage*, first air broadcast on December 21, 1980 by Public Broadcasting Service).

4 In *Steps to an Ecology of Mind.* 1973. St. Albans, Paladin (pp. 464-469)

5 Bateson explains: "The increase of population spurs technological progress and creates the anxiety which sets us against our environment as an enemy; while technology both facilitates increase of population and reinforce our arrogance, or 'hubris', vis-à-vis the natural environment...[T]he bigger the population, the faster it grows; the more technology we have, the faster the rate of new invention; and the more we believe in our 'power' over an enemy environment, the more 'power' we seem to have and the more spiteful the environment seems to be" (1973: 466)

between mind and matter, the autonomy of the individual self in relation to what is perceived as Other, and the separation of the human being from the rest of nature. Charles Eisenstein (2007, 2011) regards these assumptions as being part of the defining ideology of our civilization and which are at the core of modern industrial culture and economic system.

Drawing on Bateson's insights, ecojustice aims to orient educational reforms toward the cultivation of ecological intelligence – an ecologically-centered way of knowing that help us recognize our membership within the web of relationships that form the ecological communities we inhabit (Lupinacci 2013). The recognition and guidance by the knowledge of human dependence on and participation in natural systems is here defined as ecological or systemic wisdom.

The first fundamental step toward ecological wisdom is therefore to recognize the philosophical and epistemological assumptions and patterns of thinking that, in the increasing globalized industrial consumer culture, are at the basis of the dominant worldview and thus influence our perceptions and relationships to the environment.

PART III: THE CULTURAL ROOTS OF THE ECOLOGICAL CRISIS

> Problems cannot be solved with the same mindset that created them.
>
> *Albert Einstein*

Aim of Part III is to disclose the ecological implications of modern Western worldview, that is, understanding how established assumptions about the nature of humans and their place in the world influence the ways in which we relate to the natural environment. In addition, some significant ideas that point towards an ecological understanding of human-environmental relationships will be identified. For this purpose, drawing from a literature review and moving within an ecojustice framework, I will present a synthesis of what Martusewicz et al. (2011: 48-86) call “cultural ecological analysis” (CEA) - a critical analysis of the main assumptions and discourses of modern Western thought carried out from an ecological perspective. Before that, I will define some relevant concepts adopted in the analysis.

3.1 Worldviews

An important concept adopted in the CEA is that of *worldview.* A worldview can be defined as the system of beliefs and discourses that a culture uses to give meaning to the world. It can be seen as a lens, or a map, through which the world (reality) is interpreted and given meaning. It literally provides a *view*, a "story of the world" (Eisenstein 2007) in which is encompassed an explanation of the nature and role of humans in relation to each other and to the natural environment. Martusewicz et al. define it as "a deeply ingrained set of ideas that structures how one sees, relates to, and behaves in the world" (2011: 66). A worldview acts like an overarching narrative, a conceptual framework within which interpretations and beliefs about the cosmos, people, and the self are unified in a coherent and meaningful way. Usually unconsciously and uncritically taken for granted as 'the way things are', worldviews are not immutable and can slowly change over time (Hart 2010).

Different cultures perceive and interpret the world in different ways and therefore have different worldviews. As we will see, Western worldview is characterized by an anthropocentric perspective that separates humans from the rest of nature and by the idea of the progressive movement of time in a linear fashion. It is also a dualistic worldview because it looks at material and spiritual realms, reason and emotions, body and soul, as separate entities. By contrast, Eastern traditional worldview views time (and life itself) as cyclical and looks at the universe as an unified whole, which means that 'all of the parts of the entire cosmos belong to one organic whole and that they all interact as participants in one spontaneously self-generating life process' (Wei-Ming 1989: 67). According to McKenzie and Morisette (2003), the worldviews of Indigenous cultures are instead characterized by the idea that all things are made of the same essence, which is understood as spirit, that links them to each other and to the greater principle of Creation. The land is considered sacred and mother of all beings, and humans are closely related to the spiritual world (Simpson 2000, in Hart 2010).

According to Winter (1996), every worldview has behavioral repercussions that may be both helpful and hurtful, depending on which behaviors are discussed. The cultural ecological analysis here presented focuses on the ecological repercussions of culturally specific (Western) ways of understanding humans in their relationships with the more-than-human

world[6].

Western worldview

As are all worldviews, our modern Western worldview is a culturally constructed view of the world (Winter 1996). In their analysis, the authors of the CEA highlight the historical and philosophical context in which modern Western worldview arose, how it became dominant and replaced previous worldviews. As illustrated by scholars such as Carolyn Merchant (1983 [1980]), Morris Berman (1981), and Fritjof Capra (1982), our modern worldview is the result of the evolution of Western thought over centuries under the influence of many sources. Among the most important are the Greek philosophers, the Judeo-Christian tradition, the Scientific Revolution, the Enlightenment, European colonialism, and the Industrial Revolution. Although we take our worldview as given, learning how to think and behave through social interaction, and accepting our beliefs as obvious and common-sensical, the defining ideas of our industrial civilization have a traceable history (in time and space) and, contrary to the common perception, are very recent[7]. The idea that humans are autonomous beings that are separate and superior in relation to the natural world is among the most notable assumptions which underlie modern Western worldview (Plumwood 2002, Eisenstein 2007, Lupinacci 2013)

As Martusewicz et al. (2011) point out, “our particular Western cultural mindset is created through specific ways of thinking that have a history and are powerful 'maps' of the world...[T]hese maps create a cultural system that is so strong that we may believe it to be inevitable or even natural” (50). This is to say that the instrumental and exploitative relationship with nature characteristic of our industrial consumer culture, and the worldview that legitimizes it, are recent events in human history and are far from being 'natural' or

6 The phrase “more-than-human”, introduced by David Abram(1996), *in The Spell of the Sensuous: Perception and Language in a More-Than-Human World*, draws attention to the larger set of living relationships within which human-human relationships are a very small number in comparison. This phrase is a nice alternative to the marginalizing common phrase of “non-human” or “other-than-human” (endnote taken from Lupinacci 2013).

7 Winter (1996: 28) offers an elucidating analogy. To get a sense of how recent our modern beliefs are, imagine our (conservatively estimated) 200.000 years old human history reduced to a year. If our history begins on January 1, agriculture, the first cities, and what we know as 'civilization' did not arise until December 19. Before that, we just lived in small hunter-gatherer tribes. The Greeks, to whom we owe much of our cultural heritage, did not create their gloried civilization until December 26. The Scientific Revolution, responsible for a radical change in the way Europeans viewed and related to the natural environment, happened after 11pm on December 31; at the same time, Europeans began to spread their view and beliefs to the rest of the world through colonization. The Industrial Revolution, which ultimately determined human mastery over nature, did not occur until 20 minutes before midnight.

inevitable (Winter 1996). They may look so only if we believe in the assumption that equates change with progress and views time – and thus history - as a linear progressive movement from the past (backward) to the future (improvement). They may seem desirable if we perceive the environment as something separate and manageable upon whose domination we believe our well-being and prosperity have to be built. They may seem justifiable if we arrogate to ourselves the higher form of intelligence and we develop a method for knowing the world based exclusively on the use of an instrumental, detached, and moral-free form of rationality.

Winter argues that "becoming aware of the limited and distinctive set of beliefs that we Westerners call "common sense" is the first step toward understanding the psychology of our unsustainable behavior" (1996: 29). A cultural ecological analysis becomes important while considering that our "common sense", what we instinctively believe as being true, does not come directly from our experience. Rather, "our [established] view of the world is shaped by centuries of Western intellectual tradition, so thoroughly embedded in our educational and social institutions that it is often difficult to appreciate it or its effects" (32). The CEA is indeed aimed to 'unpack' those primary beliefs that are unconsciously assumed, or taken-for-granted. Taken-for-granted assumptions are those beliefs that are not questioned because they are obviously considered 'true'. If not recognized and examined, they will continue to be transmitted generation after generation as part of the cultural heritage on which further knowledge will be constructed. To reiterate what Bowers (2009) argues, the dominant ideas about humans and nature that are currently transmitted by Western institutions were formed in a time during which there was no awareness of environmental limits. Nowadays, we keep acting in accordance to a worldview that legitimizes instrumental and exploitative relationships to the planet while refusing to accept the reality and seriousness of the ecological crisis. Without wanting to depreciate the role of existing power relations and economic structures in maintaining the status quo, what is argued here is that, recalling Bateson (1973), such a denial can be ascribed to deep-rooted – and thus unrecognized - epistemological errors that prevent our industrial civilization from recognizing human dependence on and participation in larger ecological living systems.

3.2 Cultural Ecological Analysis

The following analysis focuses on (*a*) the major *ideas*, or "discourses" of modernity

(mechanism, rationalism, anthropocentrism, individualism, progress) which constitute the philosophical and epistemological foundations of modern Western culture, and (*b*) the way in which such discourses are structured in language through specific patterns of thought (hierarchized dualisms, centric thinking, logic of domination). By examining how cultural beliefs and language influence our perceptions of and relations to the world, a cultural ecological analysis can help us to identify alternative metaphors that replace the dominant discourses of industrial consumer culture with metaphors rooted in ecology and interdependence rather than in individualism and separation.

3.2.1 Hierachized dualisms, centric thinking, and logic of domination

Acknowledging the ways that we depend upon language to understand the world breaks down Western myth of objectivity and subjectivity associated with knowledge (Martusewicz et al. 2011). Ecofeminist scholars such as Karen Warren (1997, 1998) and Val Plumwood (1993, 2002) argue that modern Western thought, heavily centered on rationality, has developed upon specific patterns of thinking which frame and mediate our relation to the world. These patterns of thinking have their roots in the history of Western philosophy and therefore are not universal nor immutable. The above-mentioned authors show how cultural meanings and interpretations of reality can be traced back to a series of *hierarchized dualism* that help shape our perception and relations to each other and the environment. Figure 1.1 illustrates some of the primary dualisms. What is important to note is that these dualisms represent not just the difference between the two terms; rather, the differences become hierarchized in the meaning given to each category (Martusewicz et al. 2011). The first term is always – and often unconsciously – assumed as superior and independent from the second, while the second is inferior and at the mercy of the first. The hierarchical relation between oppositional pairs occurs when one term is given more value or status than the other.

Man	Woman
Culture	Nature
Reason	Emotion
Mind	Body
Center	Margin
Civilized	Savage
Forward	Backward
Order	Chaos

Figure 1.1 Hierarchized dualisms in modern Western cultures. Adapted from Martusewicz et al (2011: 57)

This process of assigning value and creating dichotomies draws its philosophical formulation back into Cartesian dualisms and, although it may appear as the 'natural' way of thinking, is an arbitrary process (Plumwood 1993). In other words, the hierarchical opposition and categorization of terms – and thus of parts of reality – is an "*invented* superiority" (Martusewicz et al. 2011: 58). Martusewicz et al. (2011: 57-81) point out that these dualisms – structured by value hierarchies – frame the way we think of ourselves in relation to others. Value hierarchies that operate at an intellectual level have indeed strong repercussions on everyday life and contribute to maintain domination in place. For example, as argued in ecofeminism, women have been historically associated with categories like emotions, body, nature, and thus have been considered to be more adept to functions that require caring, nurturing, and serving. Defined more in terms of the reproductive capacity of their bodies rather than the reasoning capacity of their minds, women have been subjugated to the domination of men who were believed to be naturally superior for their (arbitrary assigned) higher capacity of reason, control, responsibility, and decision making. The assumptions that men's reason is more reliable than women's emotions, that the mind is more important than the body, that culture is what has freed humans form the disorder and savageness of nature, and consequently, that all that is human is superior and separate form what is natural, underlie the major discourses of modern industrial cultures and are largely responsible for the crisis in relationships (with each other and nature) that we are facing today (Berman 1981; Merchant 1983 [1980]; Plumwood 2002).

Hierarchic dualistic thinking is strictly associated with the idea of *centrism* which Plumwood (2002) refers as being another primary pattern of conceptualization in Western culture. The process of centric thinking takes place when higher value is given to what is located "in the center" with respect to what is "on the margin". Examples of this way of thinking are the use of the adjective 'marginal' for defining something which is less relevant than something that is 'central', or the use made by social justice theorists of the term 'marginalized' people to define those who are devalued, are granted less access to resources and hence have less decision-making power over what affects their lives (Martusewicz et al. 2011). The dualism 'center/margin' is indeed a powerful set of metaphors that are hierarchized.

Value hierarchies and centric thinking, on which Western ideas of anthropocentrism, androcentrism, and ethnocentrism are constructed, emphasize what Warren (1998) defines as a *logic of domination* which legitimizes control over what is perceived as inferior. Once the world is divided into superior, dominant, and autonomous versus inferior, marginal, and dependent realms, it follows that exploitative and instrumental relations towards whatever is defined as inferior become morally acceptable. From an ecological perspective, if the rational is superior to anything else in nature, and humans are rational, then humans are justified in controlling and exploiting nature and everything else that is – metaphorically and physically – associated with it.

This analysis supports the claim that, as argued by ecofeminism, deep ecology, and ecojustice, all forms of social and ecological oppression stem from culturally specific ways of perceiving the world (worldviews) which are reproduced by language, patterns of thinking, and system of values. Martusewicz et al. suggest that "this logic of domination, deeply rooted in Western culture, and operating metaphorically, underlies the acceptance and continuation of [gender and] class inequalit[ies], …other forms of social degradation, and ecological devastation" (2011: 63). Rebecca Martusewicz adds that "These socio-symbolic value patterns and their associated logic lead to an interwoven system of inequality and destruction that is rationalized as 'natural'" (2013: 6). Consequently, it can be argued that the reproduction of this way of thinking, while fostering the worsening of the crisis, represents in itself an epistemological barrier to the recognition of human dependence on and embodiment in what is instead perceived as separate and morally justifiable to control, manipulate, and eventually destroy.

3.2.2 Critical analysis of the discourses of modernity

The result of several centuries of human-centered thinking has been the progressive separation of humans from the rest of nature. Charles Eisenstein (2007) defines the dominant narrative of modern Western culture as the *Story of Separation* which holds that to be human is to be separate and superior to everything else. For Plumwood (2002), human separation from nature, alongside the inferiorization and exclusion of all that is perceived as Other, has led to an *illusion of disembeddedness* where rational humans are defined as autonomous from natural systems. The dominant worldview that underlies the global industrial civilization of today has its roots in the same assumptions and ideas that accompanied the rise of the ideology of modernity during the Enlightenment period in Europe (Merchant 1983 [1980]; Capra 1982). At this point, I will focus the cultural ecological analysis on discussing some of

the major discourses of modernity and the metaphors on which they are constructed. Due to space limitations, the following analysis will not examine other important discourses such as speciesism, androcentrism, and ethnocentrism. I consider it important to clarify that those discourses left outside the analysis are not less relevant nor disconnected from those included; on the contrary, they derive from the same value hierarchies and dualisms that are combined to create centric thinking and a logic of domination.

I will use the concept of *root metaphor* to show how such discourses derive from taken-for-granted hierarchized dualisms. As suggested by the plant analogy, “root metaphors are the buried ideological sources from which the culture draws strength and reproduces itself inter-generationally” (Martusewicz et al. 2011: 64). When different root metaphors combine and create weaves of meanings that depend on one another and are exchanged and internalized through communication, they form a discourse (ibid.). As metaphors and analogies get transmitted generation after generation, they become 'truths', deeply rooted beliefs that are difficult to question because they build up the framework through which reality is interpreted and given meaning (Bowers 2003).

Mechanism

Mechanism is the assumption that the universe, nature, and everything that is part of it, function like a machine. During the seventeenth century, under the influence of European thinkers such as René Descartes, Francis Bacon, Johannes Kepler, and Thomas Hobbes, the machine became the dominant metaphor through which a new reconceptualization of the cosmos, society, and the self was achieved (Merchant 1983 [1980]). Ecofeminist philosopher Carolyn Merchant argues that the Scientific Revolution marked the 'death of nature', that is, the removal of all organic, spiritual, and sacred attributes from the world.

> The rise of mechanism laid the foundations for a new synthesis of the cosmos, society, and the human being, construed as ordered systems of mechanical parts subject to governance by law and to predictability through deductive reasoning. A new concept of the self as a rational master of the passions housed in a machinelike body began to replace the concept of the self as an integral part of a close-knit harmony of organic parts united to the cosmos and society. Mechanism rendered nature effectively dead, inert, and manipulable from without (Merchant 1983: 214)

The mechanical order reduced life to discrete, predictable processes, and nature to a set of

interchangeable atomized parts that could be reproduced and replaced from outside. Combined with anthropocentrism (discussed below), a mechanical and spiritless worldview made it possible and morally justifiable to separate nature from human life, in order to control and manipulate it (Plumwood 2002). Moreover, as Merchant points out, the mechanical order had associated with it a framework of values based on power and domination which legitimized the expansion of commercial capitalism and which shaped political institutions that further emphasized the human right to control nature.

The prevailing of the mechanistic model and the development of a scientific method adapted to it involved the adoption of a *linear* way of thinking, that is, interpreting events in chains of cause and effect. Everything that happens has its own detachable and predictable cause (or set of causes), like in a machine, where a functioning problem can be isolated and eventually solved. At the same time, linear thinking is also *reductionist* thinking where phenomena are seen as problems to be broken down "into [their] component parts, isolating [them from their] environment, and solving each portion independently" (Merchant 1983: 182). As Martusewicz et al. (2011) point out, while reductionism can be useful for understanding the function of the components, it hides the interconnections and relationships among them. On an epistemological level, linear reductionist thinking is the opposite of ecological thinking[8] (Capra 1996)

Rationalism

Rationalism is the idea that intellectual and deductive reason is the ultimate source of knowledge (Runes 1962). The root metaphor 'reason is knowledge' derives from the hierarchized dualisms mind/body and reason/emotion where the cognitive and intellectual capacity of the human being is assumed to be superior to sensory and spiritual experience. As Winter (1996) notes, the dualism mind/body, which is one of Descartes' most lasting contribution, provided the basis for the Western separation between human consciousness and the rest of nature.

The mechanistic worldview and the reason-centered conceptualization of the human being led historically to the assumption of another powerful metaphor that is still dominant today:

8 A non-reductionist view of science is characterized by what has been defined on purpose *non-linear thinking.* Important disciplines that contributed to its formulation are quantum physics, cybernetics, ecology, general systems and living systems theory, chaos theory, and theory of complexity.

science is knowledge. Science bases its claim of universality and objectivity on the belief that to know the natural world one needs to control it by using a value-and-culture free form of rationality which detaches the 'knower' (subject) from the 'known' (object of study). This basic epistemological assumption emphasizes the idea that, through the scientific method, humans are able to know the world *in function* of their separation from it.

By focusing attention on the presumed (literally, assumed *a priori*) objectivity of the scientific method I do not aim to question its contributions to our understanding of the world; rather, the point made here is that science is itself a discourse (Martusewicz et al. 2011) because is based on cultural assumptions. These dominant beliefs suggest that only what is measurable and observable is real (reductionism) and therefore that science is the only reliable way to know the world. As a consequence, other ways of knowing, such as spiritual or experience-based knowledge, are dismissed.

Particularly since the last five decades, within some fields of science another paradigm is emerging which sees science as one way of knowing rather the only valid one. Overcoming the limitations of mechanism and reductionist thinking, the ecological – or holistic, systemic, non-linear – perspective in Western science matches the perspectives held for centuries by different Indigenous cultures and Eastern spiritual traditions that recognize the interconnectedness and interdependence of all living and non-living beings (Capra 1975). Although at an academic level the debate on the necessity for science for a paradigm shift is well established, the alarming worsening of environmental destruction demonstrates that such a shift is still far to be accepted.

Anthropocentrism

Anthropocentrism refers to the belief that humans are the central and most important species on the planet. An anthropocentric worldview assesses reality exclusively from a human perspective and values the more-than-human world in relation to the benefits it offers for human purposes. According to Merchant (1983 [1980]), the historical roots of anthropocentrism in Western culture can be traced back to the biblical mandate that granted humans the “dominion” or “stewardship” over the natural world, going through Plato's assertion that knowledge about reality did not come from any connection with earthly relations but resided in pure abstract 'forms' that were only accessible to the reasoning capacity of the individual. The Judeo-Christian tradition, the Enlightenment, and the

Industrial Revolution, all remarked the supremacy of the human being over nature and his right – if not duty – to exploit her[9].

Anthropocentrism internalizes a hierarchized, dualistic, and centric way of thinking that rests on the 'backgrounding' and inferiorization of nature (Plumwood 2002; Martusewicz et al. 2011). Plumwood writes:

> Rationalism and human/nature dualism are linked through the narrative which maps the supremacy of reason onto human supremacy via the identification of humanity with active mind and reason and of non-humans with passive, tradeable bodies... Rationalism and human/nature dualism have helped create ideals of culture and human identity that promote distance from, control of and ruthlessness towards the sphere of nature as the Other, while minimising non-human claims to the earth and to elements of mind, reason and ethical consideration (2002: 4)

This monological narrative leads to the denial of human dependency on and embodiment in natural systems and creates the illusion of human autonomy. Such a denial lies at the core of the instrumental and exploitative relationship that our disembodied and (ir)rational industrial consumer culture hold with the natural environment. Anthropocentric cultural assumptions have shaped the creation of modern political and economic systems and institutions that are profoundly anti-ecological because they separate human spheres from their enabling ecological support base which is systematically denied and deprived of the resources it needs to renew itself (Plumwood 2002).

Anthropocentrism is expressed in language when, for example, we discriminate between 'higher' o 'lower' animals depending on the grade of human-like intelligence we accord to them, or every time we refer to the inhabitants of the more-than-human world as 'natural resources', which implies that nature is primarily a resource for humans, rather than having an intrinsic value and the right to exist (Devall and Sessions 1985; Martusewicz et al. 2011). However, as Plumwood (2002) notes, anthropocentrism is much more than a matter of perception, of abstract beliefs about superiority and inferiority. It is tested by behavior and by its constant reproduction in social life. Recalling Bateson's explanation of self-promoting phenomenon (see p. 24), the more our institutions and technology separate us from the

9 In this context, I intentionally refer to the human being as masculine and nature as feminine to remark how the anthropocentric discourse is deeply biased by masculine (androcentric) language.

connection with the natural world, the more we believe in our exemption from natural constraints and deny our dependence on larger living systems. The greater the separation, the deeper the illusion of autonomy.

The consequences of anthropocentrism can be observed in the treatment that industrial consumer societies make of the natural world: air and water pollution, soil degradation, deforestation, ruthless manipulation and killing of animal life, wildlife habitat destruction, commodification of natural system and services, land ownership, to name most serious ones. Deep ecology thinkers consider that environmental stands that advocate for pollution reduction, resource conservation, and a general wiser environmental management for the benefits it would bring to a more sustainable development of human societies are anthropocentric and thus 'shallow', because they do not address the deep-rooted assumptions that guide the commodification and exploitation of nature (Naess 1973).

Individualism

At the heart of the ideology of separation is the assumption that humans are autonomous agents who are naturally predisposed to satisfy personal interests. Individualism defines the human being as an independent Self, or “I”, which is the source of all rationality, knowledge, and decision-making. As a separate Self living in an objectified world of Others, the individual is assumed to maximize personal success through material accumulation and private property. This view of human nature naturalizes a system of values that promotes competition as the most beneficial force guiding societal organization. Furthermore, while asserting the principle of equality of all humans and celebrating individual rights and capacities, individualism hides the dependence of the individual on the cultural and natural environment in which he or she is embedded. Going once again back to Bateson's work, as Martusewicz et al. posit,

> This discourse has led to the idea that mind, or human intelligence is something that grows out of individual thought and is the result of independent brain power, or natural talent... [S]uggesting that ideas or meanings come solely from within someone's head hides the way we exchange and create meaning via language in relationship with each other and, as Bateson teaches, in our interdependency with the natural world. In short, it ignores the cultural and ecological influence on thinking, and encourages the individual to assume they are autonomous (2011: 71-72)

Alongside anthropocentrism, individualism is probably the most profoundly accepted and thus unquestioned assumption of modern Western culture which shapes and is reinforced by our institutions, first of all, educational institutions. As we will see in the next part, educating in the belief of individualism does not allow for the cultivation of a 'sense of belonging' of people to their human and non-human community[10] necessary for a responsible relationship with each other and the natural world, while on the contrary it promotes the model of consumer-entrepreneur who is successfully adapted to the global industrial consumer society.

Progress

Progress as a discourse is constructed on a set of interlocking root metaphors. The first is the conception of time as moving in a linear way. Whereas ancient civilizations and many indigenous cultures of today see the passage of time in circular terms, celebrating the cycles of nature (Winter 1996), modern Western thought conceives time as constantly moving forward. Linked to the linear view of time is the assumption that change is improvement, for which the new is perceived as being better – superior, more advanced, more developed - than the old. This set of beliefs, which has its origin in modern thinking, has given rise to the dominant narratives of the industrial culture: development, economic growth, technological advancement. Human societies are seen as 'naturally' evolving from simple communities of hunter-gatherers to complex industrial societies. Hierarchized dualisms such as forward/backward, civilized/savage, complex/simple, coupled with the idea of linear movement of time, made of progress and growth the natural forces that sanctioned the supremacy of Western culture and legitimized the imposition of its values and model of development.

While it should be emphasized that progress is not bad in itself, the assumption that change is progress, and thus that the present is always an improvement of the past, hides the negative impact that social and technological change may have on society and the environment. Progress as discourse leads to the loss of traditional knowledge and older ways of living as they are replaced by new discoveries and innovations, and rationalizes the acceptance of destructive changes on the assumption that it is unavoidable (Martusewicz et al. 2011).

10 In this context, I use the term “community” to refer to the widest range of communities to which humans are part, from local neighborhood-based communities to the biotic community which includes all forms of life.

3.3 Overcoming unsustainable assumptions

By focusing on the cultural dimensions of the ecological crisis, a cultural ecological analysis of Western worldview illustrates how deeply embedded beliefs about humans and nature build upon each other to maintain a logic of domination and the attending political and economic systems in place. Dispelling the myth of objectivity and universality of Western assumptions opens the door for a radical cultural change towards embracing a different framework of values and according habits of behavior.

This analysis points to the possibility of using different ways of describing and representing the world through the adoption of different metaphors that redefine humans as ecologically embedded beings and the natural world as web of interconnected systems of which human societies are an inseparable part. In this sense, educational institutions, which are entitled by society to transmit values, knowledge, and practices, can play a fundamental role. From being part of the problem they can become part of the solution.

It would be naïve though to believe that the industrial mega-machine that is devouring the planet can be stopped by a 'simple' change in perceptions about our relationship with nature; at least, it would not happen fast enough to avoid even more serious crises. In fact, it could be argued that debating different visions of nature is a sterile intellectual exercise considering the impact on the environment of an ever-growing human population that is adopting the consumer lifestyle. Similarly, we may ask: what does it matter to discuss philosophical assumptions and values when even the most conservative predictions on the rise of the Earth's temperature foretell irreversible and unpredictable changes in ecosystems?

However, political decisions are framed by culture, and culture, other than artifacts, is made of ideas. The radicalness of behavioral changes that the ecological crisis imposes us to embrace requires such changes to be grounded and guided by profound shifts in values, that is, in culture. An effective response to the ecological crisis must go beyond conventional debates on environmental policies. As Martusewicz et al. (2011: 67) argue, “we must reach for a deeper challenge to the very roots of the destructive aspects of our culture” and change them. The challenge we face is not just that of remedying the ongoing problems, it is to abandon the mindset that created those problems and that is unable to respond to them.

3.4 Toward ecological wisdom

Drawing from the cultural ecological analysis, I expose a list of ideas that summarize some of the possible standpoints for an ecological understanding of human-environmental relationships. They can be seen as 'bricks' with which we can build an ecological approach to learning.

1. Culturally specific ways of thinking are at the core of the ecological crisis and their reproduction represents one of the main obstacles to a thorough understanding and response to it.
2. The worldview proper of each culture conditions the way in which humans relate to the natural environment.
3. We are overshooting the sustaining capacity of natural systems largely because “our modern worldview provides a set of beliefs that encourages us to use and abuse nature” (Winter 1996: 29). The destructive relationship with nature characteristic of our industrial consumer culture, and the worldview that legitimizes it, are recent events in human history and are far from being 'natural' or inevitable. Thus, they can be changed.
4. 'Unpacking' unquestioned beliefs and assessing whether or not they contribute to a harmonious relationship with each other and the more-than-human world must become a central epistemological practice and a way of living.
5. The recognition that human autonomy is an illusion. The idea of the independent Self living in a world of Others, the separation of the individual from the community, and of humans from the rest of nature are culturally specific assumptions with serious ecological implications.
6. The recognition of human dependence on and participation in larger ecological living systems. Human life is part of the greater web of Life: whatever humans do to the web, they do it to themselves.
7. The importance of cultivating ecological wisdom. This means, first of all, to overcome the limitations of reductionist linear thinking that, by reducing events to univocal cause-effect sequences, does not acknowledge the interconnections between all parts of the environment in which phenomena take place. Ecological wisdom is the recognition of and guidance by the knowledge of interrelatedness.
8. The acknowledgment that change does not always imply improvement, nor that the 'new' is inherently better than the 'old'. While there is much that needs to be changed in

> Western ways of living and thinking, such changes do not imply necessarily new inventions or discoveries. Rather, sustainability and harmony with natural systems will require human societies to aim towards permanence, preservation, and responsibility, virtues that we can learn from traditional (non-industrial) ways of living and Indigenous cultures.

PART IV: ECOLOGICAL EDUCATION

> As our new century unfolds, it is becoming more and more evident that concern with the environment is no longer a single issue – it is the context of everything else.
>
> *Fritjof Capra*

Aim of part IV is to explore how a reconceptualization of education can help restore ecological wisdom. I will use the idea of *ecological education* (Smith and Williams 1999) to define the multiple approaches and practices committed to educating for a sustainable living. The way I adopt this concept is not to label the content of a specific *eco*-curriculum; rather, it refers to educational theories and practices grounded on an ecological understanding of the world and the human place in it. As emphasized by Smith and Williams, "the practice of an ecological education requires viewing human beings as one part of the natural world and human cultures as an outgrowth of interactions between our species and particular places" (1999: 3). To this standpoint, I add that one of the main issues of ecological education is that of building upon practices that are based on the following tenets: *i*) foster care and understanding of how human actions interact with Earth's processes over short and long time and spatial scales; *ii*) do not degrade ecosystems and their human and more-than-human members; and *iii*) do not reduce the inherent capacity of the Earth to sustain life.

The framework of an education for a sustainable living is summarized by Capra and Stone (2010) in four guiding principles: nature is our teacher; sustainability is a community practice; the real world is the optimal learning environment; sustainable living is rooted in a deep knowledge of place. Drawing from the existing literature, I will examine three approaches to education that embody the above-mentioned principles and are based on ecological

perspectives. Specifically, I will look at the concepts of *ecological literacy* (Orr 1992; Capra 2005), *place-based education* (Gruenewald and Smith 2008; Smith and Sobel 2010), and *education for the commons* (Bowers 2006a; Martusewicz et al. 2011). I will argue that these approaches are complementary because they share the same values and vision of sustainability. Deeply concerned with the challenges of our time and the role played by dominant educational models in reproducing unsustainable ways of living, they offer strategies to reclaim the ecological wisdom necessary to build and support just, diverse, and sustainable communities.

4.1 Ecological literacy

A fundamental goal for an education for a sustainable living is the development of ecological literacy. The concept of ecological literacy was first elaborated by environmental science professor and educator David W. Orr (1989, 1990, 1992) who saw it as the main driver for a radical reformulation of education at all levels on ecological basis. Ecological literacy in its broadest sense can be defined as the ability to recognize and understand the multiple interwoven relationships among the living and non-living systems that constitute the Earth. For Fritjof Capra, ecological literacy is the ability to understand the basic principles of ecology and to live accordingly (Capra 1996). For Orr, the relevance of ecological literacy lies in the conviction that no prospect of transition towards a sustainable society can be achieved without the active participation of an engaged, responsible, and ecologically wise society. He writes that “ecological literacy...implies a broad understanding of how people and society relate to each other and to natural systems, and how they might do it sustainably” (1992: 92). Although in his writings Orr does not differentiate between ecological and environmental literacy, I will expressly adopt the term 'ecological' to define the kind of literacy at which education needs to aim. In fact, ecological literacy does not imply only knowledge about ecosystems and the natural world (that is, environmental literacy) but emphasizes the importance of understanding the relations that exist among the multiple nested systems comprised in the biosphere, including human societies. It is a holistic, or systemic, comprehension of the *interrelatedness* of life which starts from the recognition that humans are only a part of a larger whole, and that our well-being and prosperity are contingent on that of the entire system (Capra 1996, 2002, 2005).

Ecological literacy emphasizes the relations between ecology, economy, politics, science,

culture, and so forth, in order to overcome the disconnectedness and narrowness of perception that have resulted in the overspecialization of disciplines characteristic of Western science and education. As Orr argues, “we have structured education and the entire knowledge enterprise along Cartesian lines stressing reductionism, discrete entities, linearity, and simple causation, and must now shift to perceive patterns, context systems, and complex networks of causation that span the sciences, social sciences, and humanities” (1992: 144-145). For this purpose, an education aimed to cultivate ecological literacy incorporates ecology as an integrative and connective principle, acknowledging than no human enterprise occurs outside an ecological context. In other words, all actions and phenomena are the result of networks of *relationships.*

The bases of ecological literacy lie on three interdependent domains: information, values, and action, what Orr defines as “knowing, caring, and practical competence” (1992: 92). The ecologically literate person is the one who “has the knowledge necessary to comprehend interrelatedness and an attitude of care and stewardship” (ibid.) with which to orient her action. In this sense, ecological literacy is applied competence. In fact, a systemic understanding of natural phenomena and human-environmental relations will not be of much use if not directed towards the reconstruction of our unsustainable way of living; and such actions could lead us to reproduce destructive relationships if not guided by attitudes of care, responsibility, and reverence for life.

4.1.1 Shifts of perception: the Theory of Living Systems

As already mentioned, the challenge of building sustainable human communities will require the development of an ecological understanding of how human societies interact with larger living systems. The good news, and an important fact we need to recognize, is that we do not have to start from scratch. We can learn from societies and cultures that have sustained themselves for centuries and we can look at the organization of nature's ecosystems, which are sustainable communities of plants, animals, and microorganisms. Thanks to its inherent capacity to sustain life, nature represent the most outstanding example of sustainability from which we can learn.

Drawing from the work of Capra (1996, 2005, 2009), I will here summarize the basic

principles of ecology understood from the emerging theory of living systems[11] which nowadays is considered to offer, from a scientific perspective, the most useful framework for understanding the patterns of organization of living communities. Although thinking in terms of complex systems is at the forefront of science – and is still not established in mainstream culture -, it is a way of thinking whose principles were common to ancient cultures where people sustained themselves in their environment for many centuries, in some cases until today.

The theory of living systems helps provide a new scientific understanding of life – a new worldview – in which the planet is no longer seen as a machine composed of elementary building blocks but as a network of inseparable patterns of relationships. The earth as a whole is a living, self-regulating system. So, what is living system?

- Every living organism, from bacteria to all plants and animals, including human beings, is a living system.
- Parts of living systems, like a cell, a leaf, an organ, the neural systems, and so forth, are themselves living systems.
- Communities of organisms, including ecosystems and human social systems, like families, schools, economies, are living systems
- The interconnection of all living systems – the biosphere – is a living system.

Two basic characteristics differentiate living systems from the dominant scientific perspective. First, they are non-linear – they are networks – while the whole scientific tradition is based on linear thinking, that is, chains of cause and effects. Linear thinking assumes that if something works, the more of it the better. In non-linear systems, if something is good, more of the same does not necessarily imply improvement because they are regulated by cycles. The goal is not endless growth, but stability and resilience. Second, the essence of living systems is non-material; as said, they are networks of relationships, of interactions between parts, and they cannot be measured through reductionist means.

Understanding living systems and the ecological principles that regulate them requires a fundamental shift in the way we see the world and think about it – in terms of *relationships*,

11 For a more complete overview of the theory of living systems see Capra's work *The Web of Life* (1996) and *The Hidden Connections* (2002).

connectedness, and *context.* This ecological thinking involves several shifts of perception:

> *From the parts to the whole:* living systems are integrated wholes which manifest properties that their smaller parts do not have. They are more than the sum of their parts.
>
> *From objects to relationships:* whether ecosystems or human systems, living systems are communities, which are not just a collection of species, but a network of relationships nested in larger networks. From an ecological (systemic) viewpoint, what characterizes a living system are not the isolated parts (objects) but the relations between them.
>
> *From objective knowledge to contextual knowledge:* the shift of focus from the parts to the whole implies a shift from analytical thinking to contextual thinking. The properties of the parts are not intrinsic, but can be understood only within the context of the whole. Since explaining things in terms of their contexts means explaining them in terms of their environment, all systems thinking is environmental thinking.
>
> *From quantity to quality:* understanding relationships requires a shift in the way we perceive the functioning of communities. Since relationships and contexts cannot be put on a scale or measured with a ruler, the study of communities requires to overcome the limitations of reductionist quantitative approaches.
>
> *From structure to process:* systems develop, adapt, and evolve. Thus the understanding of living structures is inextricably linked to understanding the processes of co-adaptation, change, and transformation of the species and their environments.
>
> *From contents to patterns:* by drawing maps of relationships, we discover certain configurations of relationships that appear repeatedly. These configurations, or patterns, are essential to understand the principles of organization of living systems.
>
> *Adapted from Capra 2005: 20-21*

Ecological thinking can be applied to all the disciplines, of both natural and social sciences, that deal with living systems, like anthropology, psychology, ecology, biology, economics, politics, sociology, architecture, education, etc., so that they can be unified under a common framework. This does not mean to eliminate the division of knowledge in different disciplines, but rather to bring knowledge back to its context – the patterns of relationships

that connect all living systems.

4.1.2 Principles of sustainability

Because human systems are living systems, we can apply ecological thinking for designing sustainable human communities by looking at the principles of organization of ecosystems, which are sustainable by definition. Of course, given the differences between natural and social systems, not everything we need for building just, diverse, and responsible communities can be learned from ecosystems. Nevertheless, "we can identify core concepts that describe the patterns and processes by which nature sustains life" (Capra 2005: 22-23). This means that we can model human communities after the patterns of organization that nature has developed to sustain all forms of life over billions of years. In this way, we can find our place within the network of relationships that connects all members of the earth. Such concepts can function as principles of sustainability, or principles of community. In this section, drawing from the work of Capra (1996, 2005, 2009) and Stone and Barlow (2005, 2011), I will expose how the principles of ecology relate to one another in sustaining ecosystems and how they can be applied in human communities.

The starting question is: how does nature sustain life? Capra explains,

> These closely related concepts [principles] are different aspects of a single fundamental pattern of organization: *nature sustains life by creating and nurturing communities* (2005: 23. Italics added).

Networks

All members of an ecological community are interconnected in an intricate and vast network of relationships - the web of life. They derive their essential properties, and in fact their very existence, from these relationships. Sustainability, then, is not a property of a single organism or species, but a property of the entire network.

This fundamental principle helps us understand how, in order to be sustainable, human living necessarily requires to mesh with the intrinsic sustainability of the ecosystems of which humans are part. As Orr says, "this means designing human enterprise to fit nature, not attempting to redesign nature to fit infinite human wants" (1992: 156). The achievement of sustainability for human modern societies requires a fundamental shift from an

anthropocentric-individualistic worldview to an eco or biocentric perspective that allow us to recognize, and act in support of, the networks of relationships in which we are embedded.

On a local level, sustainability is a process of engagement of the total community, and requires the active participation of all its members. Single businesses, institutions, or infrastructures cannot alone be sustainable – what is sustainable is the network of relationships they are part of and from which they derive "their" sustainability.

Making decisions, solving problems, achieving goals require bringing all the people affected together in networks of support and conversation so that the resulting interactions will enhance the resilience of the project and the endurance of its results.

Nested Systems

Throughout nature we find living systems nesting within larger living systems, that is, networks within networks. Every system forms an integrated whole while at the same time being part of a larger whole. For example, cells are part of organs, which are part of organisms, which form a species part of ecosystems. Similarly, public schools are part of neighborhood districts, which are regulated by municipal, regional, and national educational policies.

Although systems at all levels present the same principles of organization, each system represents a different level of complexity. At each level, systems exhibit properties that do not exist at lower levels. The larger the network of relationships, the more complex is the system.

Systems are influenced by the larger systems of which they are part, and in turn influence those systems. As Capra (2005) and Stone and Barlow (2011) suggest, enduring changes require addressing multiple scales and adopting strategies that are appropriate for different levels. Since schools are nested within communities, societies, and, ultimately, cultures, the development of ecological literacy throughout the population will require actions at multiple levels so as to target public institutions, businesses, politicians, medias, etc. However, acknowledging that systems are always part of larger systems does not mean that change must derive from the largest down to the smallest level. On the contrary, enduring changes are more effective when they take place on local levels where people who know each other can establish direct and trustful relationships.

Interdependence

Interdependence is probably the most basic and intuitive fact of life. The subsistence of individual populations and that of ecosystems are interdependent. Animals depend on plants' photosynthesis for their energy, and plants need the carbon dioxide produced by animals and the nitrogen fixed by bacteria at their roots. Together, plants, animals, and microorganisms sustain ecosystems and maintain the conditions necessary for life. In Capra's words, "life did not take over the planet by combat but by cooperation, partnership, and networking" (2005: 25).

Diversity

Diversity is strictly connected to the resilience of ecosystems. The more species inhabit an ecosystem, the more complex and multiple their interconnections, the more resilient the ecosystem will be. Biodiversity means that different species can carry out similar ecological functions, so that they can partially replace one another in case of disturbance. In fact, communities lacking diversity like agricultural monocultures are highly vulnerable to pests and diseases because they do not have the resources (relationships between species) necessary to resist the stress, and therefore they rely on external inputs (pesticides and fertilizers).

In human societies, cultural diversity plays the same function. Given that the ecological crisis cannot be solved with the same mindset that created it, the preservation and nourishment of different ways of knowing and thinking will be essential to undertake the transition we need. Diversity means different relationships, different approaches to the same problem.

Self-sufficiency

A defining characteristic of ecosystems is their capacity to continually generate, recover, and perpetuate themselves. Thanks to the constant flow of solar energy, ecosystems establish all the relationships necessary to sustain themselves and their species, to replace their components when deteriorated, and to adapt to disturbances. All that an ecosystem needs is found within it. In this sense, they are self-sufficient. Self-sufficiency is strictly related with diversity, for which same needs are fulfilled by different species and vital functions are not likely to be interrupted. Forests are a great example of diversity, resilience, and self-sufficiency. On the other hand, as we have seen, monocultures are completely dependent on external flows of energy and matter for their survival.

Similarly, sustainable human communities would have to reduce at minimum their dependence on external sources in relation to food, energy, water, materials, expertise, etc., and optimize local available resources. Once again, diversity will ensure different solutions, stimulating creativity and local knowledge. Community self-sufficiency will require to decentralize to a local level whatever can be best decentralized, from food and energy production to political decision-making, in order to reduce its vulnerability before systemic crises.

Cycles

With respect to matter, the planet is a closed system. This is why matter cycles continually through the web of life – water, air, minerals, and all the nutrients necessary for life to flourish and reproduce are continually recycled through ecosystems, whose cycles are nested within the larger cycles of bioregions and the biosphere. Food chains are a clear example of how nutrients cycle through ecosystems, with the organisms at the top of the chain eventually eaten by decomposer organisms which bring matter back into the system. An ecosystem generates no waste, because one species' waste becomes another species' food.

It appears clear how industrial economies are in conflict with nature's basic functioning. While nature is cyclical, industrial processes are linear – they extract raw materials and transform them into products plus waste. Industries' generation of waste – and general environmental degradation - is the inevitable result of a growth-oriented economic system which places profit over the viability of ecosystems and the health of communities. Neither infinite growth nor waste, however, exist in nature. In order for industrial systems to be sustainable, all materials that exit the processes of production – both goods and waste – must eventually become nourishment for something new so that resources can cycle continually through the system at a pace that allows life to flourish and reproduce itself.

Flows

All living systems, from organisms through ecosystems, are open systems. The constant flow of solar energy is what sustains life and drives most of the ecological cycles, but energy itself does not cycle. When it is exchanged through the system, energy is transformed from one form to another – for example, solar energy is transformed into chemical energy through plants' photosynthesis; or chemical energy stored in petroleum is converted into mechanical

energy to power machines. During the process of transformation some of the energy - often much of it - is inevitably dispersed as heat (law of entropy). This means that organisms and living systems are dependent on a constant inflow of energy.

A sustainable society would use only as much energy as it can obtain from renewable, efficient, environmentally benign and socially just sources. The first urgent and unavoidable step is to reduce the energy demand of human systems, a challenge that is as much technological as it is cultural.

Development

All living system develop, and all development involves learning. Ecosystems develop through a series of successive stages, from rapidly growing and expanding pioneer communities to perennial communities and slower ecological cycles. At an individual level, the unfolding of life manifests as development and learning; at a species level, it manifests as evolution. In ecosystems, evolution is not limited to the gradual adaptation of organisms to their environment, because the environment itself is a network of living organisms which is capable of adaptation and creativity. Individuals and environment adapt to one another, they coevolve.

As properties of living systems, development, adaptation and coevolution are non-linear, for which it is not possible to fully predict or control the changes we introduce in living networks. As systems develop, they generate emergent properties that are not predictable from the properties of their parts. This means that small changes can have profound effects for the whole system. On one hand, small actions like community efforts to protect public spaces from being privatized and turn them, for instance, into collective gardens can open the possibility for neighborhood members to enjoy local, fresh, and healthy food, which can create the opportunity to change consumption habits, which can help building face-to-face relationships, which can support local businesses and farms, which can ultimately strengthen sustainable communities. At the same time, on the other hand, non-linear processes can lead to harmful consequences whose magnitude and long-term impact cannot be foreseen, like the introduction of huge amounts of chemicals into the soil, air, and water, as well as in the human body; the genetic modification of organisms; or the massive reduction of the earth's biodiversity. A sustainable society would be cautious to undertake actions with unknown outcomes while committed to preserve everything that sustains the integrity and beauty of

living communities.

Dynamic balance

All ecological cycles act as feedback loops, so that the ecological community constantly regulate and organizes itself, maintaining a state of dynamic balance characterized by continual fluctuations. Fluctuations and readjustments of balance after disturbances take place between tolerance limits, beyond which the system can no longer compensate. Lack of flexibility manifests itself as stress which, beyond a certain point, can be destructive for the system.

This principle applies also to social systems. Linear, growth-oriented systems seek to maximize and expand all variables and processes instead of optimizing them. Beyond certain levels, this trend will lead inevitably to the destruction of the system as a whole. Human communities that strengthen their self-sufficiency, diversity, and network of relationships among their members and with other communities – in one word, their resilience – will be able to resist instability and maintain their own integrity, while being able to give space to the emergence of new forms and patterns of organization. The sustainability of human communities is tightly linked to their capacity of mediating between conservation and change, tradition and innovation, in an uncompromised support for life and its diversity.

When we learn to see the world in terms of relationships, we can clearly recognize how our way of living that is responsible for the ecological crisis is rooted in a profound misunderstanding of such relationships. Only when we will understand our place in the network of relationships that is the web of life, we will be able to indefinitely sustain human communities.

4.1.3 Implications for education

By adopting the framework provided by an ecological or systemic understanding of life, it follows, as Orr argues, that “all education is environmental education” (1992: 90). Orr notes that, depending on what is included or excluded, emphasized or ignored in every subject of school curricula, students learn that they are part of or separated from the natural world. Therefore, the development of ecological literacy is not the purpose of an isolated discipline – rather, the formation of an ecologically literate citizenry needs to become the goal of the whole educational process. If we recognize the need of educating ourselves about how to live

well in the places we inhabit, ecological literacy can provide an answer to the questions: what do we really need to learn? Which kind of competence can help us building just, diverse, and sustainable communities? Which knowledge will allow our children to live with prosperity on the planet we will leave them?

Monaghan and Curthoys (2008: 12) summarize the content of ecological literacy in six main competencies:

- Natural history skills that foster familiarity with community members and life-sustaining processes of one's own bioregion, as well as the ability to interpret ecosystem health.
- Awareness, sensitivity and compassion toward other life forms that engenders kinship with natural systems.
- Knowledge of ecological laws and patterns that inform how actions might affect natural systems.
- Critical thinking skills that illuminate connections between actions, the health of natural systems and community well- being.
- A sense of responsibility, willingness and practical skills that enable engagement in creative and socially just actions addressing sustainability issues.
- Understanding of cultural values and worldviews that affect human perceptions of and relationships with nature.

For Orr (2004), ecologically literate students must possess a basic comprehension of: the principles of ecology; the laws of thermodynamics and how they affect human-environmental relations; energetics; limits and impacts of technology; appropriate scale of human endeavors; principles of ecological design; the basics of sustainable agriculture and forestry; steady-state economics; and environmental ethics. Besides this list of theoretical and analytical competencies, an ecological education should provide the practical knowledge necessary to master "the art of living well in a place" (Orr 2004: 14): growing food; building shelter; the use of solar energy; recycling of water and waste; and knowledge of local soils, flora, fauna, and water sources.

As we have seen, ecological education is *applied* education – an education that joins theory and practice into concrete actions. It does not aim only to teach information about sustainable human-environmental relations, but also to provide the 'tools' necessary for living a life according to ecological principles, which means incorporating these principles into the way we think, design, build, and live. Orr (1992, 2004) points out the importance of the way in

which learning occurs because students taught to develop environmental awareness in a setting that does not alter their relationships with the ecological community on which they depend might learn that is sufficient to “intellectualize, emote, or posture about such things without having to live differently” (1992: 91). In this sense, ecological literacy implies a way of learning that is experiential and participatory, in which the boundaries between schools and the community are dissolved. Illich (1971) warned that the exclusive monopoly of the content and process of education held by schools and universities detaches the process of learning from the world [that outside the school's walls] that consequently becomes non-educational, that is to say, not regarded as a viable source of knowledge. By (re)accepting nature as our teacher and by making of our ecological communities our learning environments, an experience-based learning would reengage students with their human and non-human surroundings in a meaningful way. A genuine engagement and interest in the complexity of nature's relationships requires a holistic approach that balances between abstract and experiential forms of knowing and learning. It is necessary to see, feel, hear, touch, and taste the interrelatedness present around us, not only discuss about it. It is fundamental to acquire competences, to experience, that is to *live*, in order to develop feelings of care, empathy, responsibility, and belonging.

4.1.4 The school garden

Because it is essential to all forms of life, being the primary form of connection of organisms to their environment, food represents an ideal entry point for teaching the principles of ecology in schools (Capra 2009). Reconnecting children with the fundamentals of food allows them to experience the fundamentals facts of life in a way that emphasizes the interconnections between humans and nature. Growing school gardens and cooking meals as activities integrated into educational curricula are powerful and engaging practices that foster, first and foremost, the understanding of relationships – between natural elements and plants, plants and animals, food and waste, nature's health and human health. In school gardens students have the opportunity to experience the functioning of living systems and the basic concepts of ecological literacy – the energy flow from the sun to plants and animals, the cycles of nutrients, food webs, and the interconnections of systems nested within larger systems. As Capra says, “gardening and cooking are examples of cyclical work. They make us aware of how we are all embedded in the cycles of nature” (2009). Indeed, growing gardens and using them to prepare schools meals represent an example of experiential-holistic approach to learning that fosters ecological literacy. Simplifying, students plant seeds of

species that they have learned (from textbooks or contact with local farmers involved in the school project) to best adapt to the local natural environment; they harvest the edible ones and prepare meals for the school while learning cooking recipes and different cultural traditions regarding food preparation; they collect the organic waste from both garden and kitchen to make compost and return the nutrients back to the soil; then, they discuss the whole cycle as a class. In the midst of learning, they eat fresh and healthy food they have grown and cooked themselves.

The Center for Ecoliteracy (CEL) based in Berkeley, California, has been working for twenty years supporting a network of schools with holistic curricula organized around place-based projects. Among these, CEL supports several schools in the areas of San Francisco and Oakland in the creation and maintenance of schoolyard gardens while working at multiple levels (from school districts to state policies) to ensure fresh, organic, and local food in school lunches. One of the first and most successful example is the Martin Luther King Jr. Middle School of Berkeley where students and teachers continue to work on the "Edible Schoolyard Project" (Stone and Barlow 2005) in which a degraded asphalt parking lot was transformed into a kitchen garden. Students grow, harvest, cook, and serve food as part of their curriculum. MLK Middle School principal Neil Smith notes that the garden radically changed the culture of the school because it was the result of the joint participation and commitment of different members of the school community, from students and teachers to administrators and parents. The achievement of such a result, Smith explains, despite the initial resistance of several teachers, created a sense of belonging and community around the school which have opened the way for other projects that are improving the school environment, for both students and teachers.

Stone and Barlow (2005, 2011) report that teachers and educators teaching ecological literacy have discovered that learning and cooperation often increased, and grades and retention improved, when learning is integrated with hands-on activities that involved the natural world. By stimulating all their senses and allowing them to be more physically active, school gardens – as well as other outdoor projects that involve the stewardship of and connection with particular ecosystems – cultivate children's innate sense of wonder and experimentation while engaging them in projects that matter. Teachers have recognized that these experiences are fundamental in forming children's values and sense of responsibility for themselves, their communities, and the environment.

Food is also an ideal starting point to address the connections between culture and the environment. As evidenced by the work of the CEL, food systems are nested within larger educational, political, and economic systems that in turn reflect larger cultural trends, such as centralization, industrialization, homogenization, and globalization (Stone and Barlow 2011). This understanding makes of food a proper focus for the study of sustainability and an effective starting point from which to develop ecological thinking and sustainable habits of behavior. Beyond the principles of ecology, understanding how food gets from the seed to the table requires addressing how agriculture is connected with resources extraction, flows, and use, trade policies, cheap energy-dependent transportation, pollution, biodiversity, water quality, and soil conservation. Furthermore, food can open the opportunity for discussing sustainability issues in relation to hunger, poverty, health, biotechnologies, and climate change. Ultimately, designing curricula around the fundamentals of food and integrating school gardens as experience-based learning settings is a way of bringing ecological literacy and sustainability at the center of education.

4.1.5 The cultural dimensions of ecological literacy: intergenerational knowledge rooted in place

As mentioned introducing the theory of living systems, the understanding of life in terms of relationships, interdependence, and communities, although relatively new in science, is an essential part of the wisdom of many indigenous cultures and spiritual traditions. For these cultures, the transmission of knowledge about how to relate to the natural environment and the ethical values attached to it has played a fundamental role in ensuring the survival of human communities throughout millennia (Armstrong 2005). The cultural understandings of how to sustain human communities in balance with the natural world have been encoded in cosmologies, tales, ceremonies and rituals, dance and music, forms of symbolic expression, crafts and technologies which are passed down, generation after generation, as a collective and shared process of education of the youth. In the absence of schools, learning occurred as part of living in communities. The elders, repository of the traditions that connected the community to the land, played an essential role in the process of intergenerational communication. As Bowers (1996) notes, these cultures understood that learning how to live in sustainable relationships with the natural world is a process based on the renewal and transmission of intergenerational knowledge that cannot be achieved by a single generation. The existence of communities was necessary in order for knowledge to be carried forward,

and the transmission of intergenerational knowledge was necessary for the sustainability of the community.

What is important to emphasize is that ecological literacy is not a set of abstract scientific notions that can be learned and applied universally from textbooks. While science's understanding of living systems identifies principles and patterns of organization that can be found everywhere in nature and can be used as guidelines for designing sustainable human communities, ecological literacy is not universal but differs from place to place. It is not 'new', and can still be found in Western cultures in the traditions and practices that were vital to ensure families and communities' self-sufficiency. Ecological literacy is part of the wisdom encoded in languages, traditions and practices that communities have developed intergenerationally in the process of adaptation to their particular places. In this sense, we can understand that an important aspect of ecological literacy is the relationship between knowledge and place. Therefore, educational reforms oriented to the cultivation of ecological literacy must avoid any pretension of being universal and recognize the specificity of every place as source for teaching and learning. As Sobel (2004) emphasizes, ecological literacy is best developed through active participation and experience-based learning in local communities within their ecological, social, political, and economic realities. Organic farming practices, old crafts, folk events and ceremonies, regional dialects, networks of mutual support, and so forth, encode the knowledge about how to live well in particular places – that is, “knowledge built up over generations of learning about the possibilities and limits of local ecosystems” (Bowers 2001: 5). In developing pedagogies and curriculum contents that foster students' ecological literacy, schools must be careful not to reproduce the modern beliefs that change is progressive in nature and therefore that the loss of traditional forms of knowledge is an inevitable consequence of the process of development (Bowers 2002). On the contrary, an education for a sustainable living should be developed starting from the discovery, revitalization, and conservation of the practices and networks of relationships that sustained people in harmony with their human and more-than-human environment and that represent alternatives to the industrial consumer lifestyle. Scientific knowledge grounded on ecological perspectives can be joined with traditional knowledge in identifying sustainable ways of living in a manner that support and renew it rather than undermine it.

The sustainability of human communities, in the same way as for ecosystems, will draw its strength from the *diversity* of relations that will support them. In human systems, diversity is,

first of all, cultural diversity. The process of rethinking education on ecological values encompasses a multiplicity of paths equal to the multiplicity of cultures and is based on the recognition that diversity is a necessary condition not only for sustainability, but also for the very survival of the human species. The following observation by Stephen A. Marglin points out the importance of cultural diversity in an ecologically uncertain world:

> If the only certainty about the future is that the future is uncertain... then no amount of planning, no amount of prescription, can deal with the contingencies that the future will reveal. That is why there can be no agriculture for the people that is not agriculture of the people, agriculture by the people.
> Peoples' knowledge developed over centuries, even millennia, is the most important safeguard against disaster and the most sure basis of a resilient, adaptive agriculture.
> For this reason, diversity is as necessary to development as human beings as it is to ecological balance. Diversity may indeed be the key to the survival of the human species... But within the human species culture rather than instinct bears the primary load of the intergenerational transmission of knowledge (1996: 241; quoted in Bowers 2001:43-44).

If we agree on the fact that the industrial consumer and growth-dependent society is undermining the Earth's capacity to sustain human and non-human life, then it is vital to preserve and learn from other ways of knowing – ecological, holistic, spiritual, indigenous, traditional, non-anthropocentric, non-industrial - which may encompass the wisdom necessary to an ever-lasting ecological balance[12]. Lupinacci (2013) argues that it is essential that we seriously and humbly look at wise cultures that have for thousands of years taught and lived by the simple principle that human beings belong to the world—and not the other way around. Yet in the Western world, as Jucker maintains, "the dominant traditions of continual change, consumerism, individual-centeredness, where the majority of people have lost all access to more sustainable traditions, need to be overcome" (2002: 4). Ultimately, acknowledging that what needs to be sustained is not the viability of the environment to fit human purposes but the adaptation of human actions in harmony with larger living systems emphasizes the cultural dimensions of ecological literacy whose learning and practicing will depend primarily

12 I acknowledge that this claim can still be interpreted as anthropocentric, for that the preservation of bio-cultural diversity is recognized necessary only in terms of its utility for human survival. As it has already been argued, this study addresses the importance of shifting our worldview towards more eco/biocentric perspectives that recognize the inherent values of all forms of life as the necessary condition for a truly sustainable human culture.

on profound shifts of values and perceptions.

4.2 Place-based education

The challenge of building human sustainable communities, as we have seen, requires to connect their members in networks of relationships and interdependence. Such networks do not involve only social interactions (human-to-human relationships) but especially the relationships of people with the *places* where they live. The concept of place can be understood as the cultural-ecological context in which all human and human-environmental relationships occur. Places are not simply geographical locations, they do not only constitute the natural environment which human communities inhabit. As Gruenewald (2008) argues, places represent the nexus of culture and environment that is the context where human and natural systems interconnect and shape one another. The concept of place is crucial for understanding how, throughout history, the successful adaptation of humans to their environments was made possible by the development of cultural responses uniquely suited to the characteristics of local geographies (Smith and Sobel 2010). Building relationships able to sustain communities in harmony with each other and with the more-than-human world requires, as a necessary condition, that people engage in the stewardship of the places where they live, being those places the context needed for the establishment of such relationships.

What role can schools and university play in fostering a connection between students and the community of which they are part and the places where they live? It is undoubted that the widespread model in which today the process of formal education is organized is often totally isolated from the immediate context of community life (Gruenewald and Smith 2008). Smith and Sobel (2010) argue that in modern industrial societies public education has from the beginning served purposes that aimed at dismantling community relationships. In the 1800s, children's attention needed to be redirected from the local, where families and communities ensured their subsistence, to the national, so that they could participate in the building of national economies. In order for national governments and commercial markets to become the guiding forces of modern societies, all the ties and loyalties that kept people and communities attached (economically and emotionally) to their places needed to be diminished. The promotion of nationalism together with the skills and knowledge required to participate in modern economies became the focus of educational curricula, while the underlying narratives of progress and development led to the progressive abandonment of local knowledge and

networks of mutual support that had been essential in sustaining communities (Sale 1995; Esteva and Prakash 1998; Bowers 2001). All of this led to the development of educational practices isolated from the life that students experienced outside the schools. This is still the reality today for millions of students in the so called 'underdeveloped' and 'developing' countries whose governments are orienting their national economies towards industrial capitalism (Prakash and Esteva 199
8).

Nowadays, the dominant model of education that is part of the recipes of economic development which are being embraced worldwide is explicitly linked in policy and practice to the narrative of economic globalization (Gruenewald and Smith 2008). Largely unquestioned by educational institutions, the discourses of economic globalization and progress, joined with the efforts of providing all individuals the same opportunities for social mobility and individual success, have put the focus of educational curricula on universal, standardized, and decontextualized knowledge for the purpose of preparing the youth to compete in the global marketplace as consumers and workers. This model of education emphasizes the purposes of individuals while overlooking – and thus separating – the needs of the wider community. Several scholars have written extensively about the role of schooling in capitalist industrial societies (see, for example, Illich 1971; Freire 1976; Gibbons et al. 1994; Braudillard 1998; Patrick 2013). Furthermore, as Gruenewald and Smith (2008) note, contributing to the educational and economic narratives that keep the focus of teachers and learners away from their own communities is the even more influential power of corporate-sponsored media which create a model of successful individual defined by commercial values and which define children and youth around the world as hi-tech consumers rather than citizens. They argue that

> A youth culture based on commodification of experience through product identification intensifies alienation from community and from the intergenerational relationships necessary to strengthening community ties. Furthermore, a technologized consumer culture reinforces a brand of competitive individualism familiar now to both school and work environments...Thus, in tandem with schooling and the narrative of globalization, corporate media distort what it means to be a person, a learner, and a member of a local community (Gruenewald and Smith 2008: xv)

Building and nurturing sustainable communities requires, among other things, a radically different approach to education that is able to inspire in learners a sense of responsibility and willingness to contribute to the well-being of the places where they live.

4.2.1 Connecting schools, communities, and the environment

With particular significance since the last three decades, citizens around the world are becoming aware of the need to take action for mediating the impacts of globalization on local cultures and ecosystems. As part of a broader social movement[13] which is reclaiming the importance of preserving cultural and natural local diversity against the homogenizing forces of consumer culture and economy, many teachers and educators have begun working to overcome the traditional isolation of schools from community life by incorporating students' experiences of local communities and places into the process of formal education. In Gruenewald and Smith's words, this *place-based* approach to education represents "a community-based effort to reconnect the process of education, enculturation, and human development to the well-being of community life" (2008: xvi). It moves from the recognition that children's sense of social membership and participation is best fostered not by removing them from the interactions of community life but by immersing them in the world of adults (Smith and Sobel 2010). By expanding the setting of learning beyond the walls of the school so as to include its social and natural surroundings, place-based education seeks to provide students with the knowledge and skills necessary to sustain the cultural and ecological integrity of the places they inhabit. To do so, teachers draws from local phenomena as source for learning, helping students to recognize the network of relationships that link the well-being of individuals to that of the community and the local and regional ecosystems. The social and ecological context of the community provides the learning environment, student work is focused on community needs and problems, and community members serve as partners and resources in every aspect of teaching and learning. Just as sustainability is a condition that involves all members of the ecosystem, so an education grounded in place for sustainability involves the engagement of local citizens, public institutions, community organizations, and the local natural environment.

As noted by its advocates, although prior to the invention of the modern school all children education was place-based, contemporary educators' attention to place by is relatively recent.

13 This movement is commonly referred as "new localism" or "bioregionalism".

The literature about place-based education reports different descriptive names to indicate the linking of local places with the process of formal education. Among these, environmental education (Orr 1992), outdoor education (Knapp 1996), bioregional education (Hensley 2011), ecological education (Smith and Williams 1999). Gruenewald points out that, unlike other educational approaches which put attention on the value of the local from a multicultural perspective, the literature and vision inspiring place-based education is "self-consciously non-anthropocentric" (2008:143). In fact, the concept of place also signifies what social and cultural studies – included educational theory – most often ignore: the *land* (ibid.), the natural environment, the more-than-human world which is part of the communities we inhabit. Therefore, the connection to places sought by place-based education involves the engagement of students in the social fabric of the community as much as the development of ecological consciousness: this means, on one hand, cultivating the knowledge of the unique characteristics of the local environment; on the other, on a broader level, it means understanding human place in ecosystems and all the place-specific interactions between the human and the more-than-human world (Gruenewald 2008). For Orr (2004), the recovery of a "sense of place" (147) or rootedness is essential for the preservation and revitalization of the cultural and ecological diversity necessary for the sustainability of human communities. He argues that sustainable ways of living "will differ from place to place, reflecting various cultures, values, and ecologies. They will, however, share a common sense of rootedness in a particular locality" (2004: 170). Developing a sense of place means to understand that a sustainable living depends on the conscious adaptation of human needs to the characteristics of the environment where life takes place. For integrating the local environment as learning context and engaging students in the study of the human-environmental relationships that sustain communities, place-based education is a powerful approach that fosters ecological literacy.

Place-based education looks at the community in its environment as both the *source* and the *recipient* of students' learning. As source, learning opportunities are found in phenomena immediately available to the experience of students. Gruenewald and Smith (2008) and Smith and Sobel (2010) report several experiences of teachers and educators around the world that practice place-based education starting both from local, real-life issues as opportunities to vehicle the content of traditional disciplines, and from designing classroom instruction in ways that incorporate local knowledge and allow students to ground broader issues to topics that are of immediate experience and of local concern. The school garden as educational

setting explored in the previous section also represents a good example of place-based education. Not only it allows children to experience different aspects of the local environment; it also creates the opportunity to open the school to the mentorship of local farmers who can both assist teachers in gardening activities inside the school and guide classrooms in practices that connect students with the life and the work of local farms. Another example can be the engagement of students in projects oriented to the preservation of local ecosystems. Students can be guided in the exploration of the surrounding environment – a river, a park, a wood on a hill, a stretch of coastline - in order to experience with their senses concepts and notions learned in natural sciences classes. By observing the diversity of life which sustains the ecosystem and by discussing the ways in which its health is interconnected with that of the community, students can help elaborate solutions to existing problems or provide strategies to prevent them. Their work can support that of local environmental organization and motivate public institutions to take action. For schools in urban settings, where the access to the natural environment can be more difficult, the same focus on the interdependence between natural and human systems can be oriented to the identification, preservation, and increase of green spaces as well as to the revitalization of degraded areas or structures for meeting specific needs of the community. The possibilities are multiple and will vary in relation to the cultural-ecological characteristics of each place.

While engaged in real problem-solving, students have the opportunity to put in practice the more theoretical knowledge of traditional subjects through a multidisciplinary approach that helps them make connections between otherwise separated fields of knowledge, and recognize these relationships at the basis of every aspect of their life. Furthermore, place-based education stimulates students' commitment by making of their curiosity and desire for purposeful activity the central motivators for learning (Smith and Sobel 2010). By creating the opportunities that allow students to apply what they encounter in classrooms to local issues and concerns, place-based learning activities demonstrate to young people the value of their own efforts. The time spent in schools becomes meaningful because it contributes to something good. In this sense, we can understand the community also as the recipient or 'beneficiary' of students' learning. Education is no longer only a vehicle for preparing individuals to pursuit their own interests, but becomes a means for sustaining communities for the well-being of all. By fostering participation and responsibility through social affiliation and stewardship of nature, place-based education helps establishing the *relationships* necessary for a sustainable living. In Gruenewald and Smith's words,

> Young people who have developed a sense of connection to place and community will be more likely to invest their intelligence and energy in efforts to restore and preserve that which is necessary to support their lives. When they have developed skills and understandings that allow them to differentiate between life-enhancing and life-destroying activities and practices, they will be better able to resist those who would exploit and colonize them and to participate in activities that will regenerate the social and natural commons once central to the perpetuation of human communities (2008: 356-357).

A place-based approach to education will be essential in supporting an ecologically literate and committed citizenry that is able to work for wise public policies and willing to care for the well-being of the places they inhabit. Finally, it is important to point out that place-based education, and the importance of rootedness it advocates for, are not aimed at bounding people to the places where they are born. It is not a call against mobility or experiencing the beauty and diversity of the planet's places. Place-based education rather aims to cultivate in people the values and competences necessary to take care of all the places they will choose to live in.

4.2.2 Reclaiming the local in a global world

Among the few certainties of humanity's uncertain future is the fact that we will have to deal with problems that will affect us on a global scale. Climate change, population increase, resource exhaustion, massive migrations of climate and war refugees, and the implementation of large-scale technologies with unpredictable impacts, to name a few, are issues of global concern whose confrontation will require a joint and coordinated effort from all governments. There is no way that the fundamental problems facing humanity, included the ecological crisis, can be dealt by communities in isolation. The globalization of the economy and the increasing influence of international policies are furthermore demanding that schools all around the world develop among new generations a deep awareness of the global (Smith and Sobel 2010). In this light, one may question the relevance and necessity of reorienting educational goals towards the local. Why do we need place-based education in the global age?

I align with others (Illich 1971; Orr 2004 [1994]; Esteva and Prakash 1998; Bowers 2006a) in arguing that one of the central mistakes driving the globalization of the economy and culture which is contributing to the contemporary crisis is the illusion that today's problems require

universal and centralized responses. Behind this illusion, there lies the assumption – grounded on linear thinking and on the narrative of separation - that the experts and technicians who manage the massive centralized systems of industrial societies are able to predict and control global phenomena that unfold differently around the world, far away from their immediate domain. Indeed, it is the belief in the superiority and autonomy of human rationality that is hiding the very nature of the human crisis (Plumwood 2002). Human hubris and illusion of control impede to recognize that the complexities of the planet and humanity in all its diversity go beyond our species' capacity to understand and manage (Smith and Sobel 2010). What is problematic is that the imposition of the industrial-consumer monoculture and, consequently, the progressive despoil of local decision-making in favor of national and international institutions and free-trade is leaving local populations unable to respond to what affects their lives. Gruenewald and Smith clearly explain:

> Much of the success of the human species can be ascribed to our adaptability, a characteristic predicated on people's ability to respond collectively and over time to the conditions encountered in specific places... [It], however, is being diminished, and traditions of successful adaptation are being disrupted and destroyed, by the imposition of a single set of understandings and a single way of life on all people everywhere. Patterns of self-and-community-reliance have been replaced by dependence on increasingly centralized institutions that have diminished the importance of more localized responses as they impose the logic and efficiencies of a market economy. This process is unraveling both the natural and the social systems that underlie our species' health and security (2008: xviii-xix).

Given the inability of centralized institutions to effectively respond to the challenges that political and economic globalization entails, it will become essential that people believe that they have the capacity to address their problems. People at the local level need to be able to take control over what affects their lives and create solutions that do not depend on distant and decontextualized decisions. While it is true that some problems require an international unified action (like, for example, carbon emission reduction), people's well-being, however, is primarily dependent on that of the places where they live, and this relation involves place-specific interactions. Local efforts aimed at ensuring community self-reliance need to remain in conversation with other similar experiences so as to connect people and communities in networks of support through which knowledge and resources can be exchanged. As Hawken (2007; in Smith and Sobel 2010) points out, knowing about efforts in other parts of the world can give people the hope and help necessary to persist in their own actions.

Place-based education is a way to empower people to take care of their places. It reclaims the importance of the local as the proper scale at which human actions can be controlled, participative democracy implemented, and security ensured. It represents a strategy for developing in people the values and capacities necessary to build communities that are able to thrive without undermining their ecological support-base. It is a means to preserve and enhance the biological and cultural diversity that sustains the web of life. Finally, it is a way to reclaim the wisdom that enabled our ancestors to create cultures that recognized the limits and possibilities of the places the inhabited, and passed down these understandings from one generation to the next. Place-based education is a tool with which we and our descendants can do the same.

4.3 Education for the commons

As we have seen, an education in place that aims to prepare students for contributing to their communities must cultivate in them the awareness of how their own health and security is contingent to the health and security of everyone and everything around them (Gruenewald and Smith 2008). This knowledge of interdependence is part of the ecological wisdom displayed by our predecessors and is still embodied by the cultures of Indigenous peoples on all continents. Now more than ever, it is imperative that such knowledge guides all human actions by becoming part of the worldview of modern industrial cultures. Interdependence is not an abstract concept that can be learned, but a “lived experience” (ibid. xxi) of all people who live in contact with the land and with its human and more-than-human members. Relationships that honor this interdependence are connected to the existence of the *commons*.

In Martusewicz et al.'s words, the commons “is a concept that allows us to recognize both the interactions between cultural and ecological systems, and the ways that certain practices, beliefs, and relationships are oriented toward the future security of both” (2011: 211). Bowers (2006a, 2006b) describes the commons as those relationships and systems that contribute to the well-being of the community and are shared without cost by all its members. Not having been privatized or turned into commodities, the commons are not owned – neither by private nor the state – and do not require money to be accessed. These include *natural commons* and *cultural commons*, whose intersection represents the totality of the ecological commons we share with human and more-than-human others.

> The commons have traditionally been understood as the environment that is available for use by the entire community. This included rivers, forests, pasture, wild animals, plants, and so forth. In short, the commons included all of the environment that sustained human life. The commons, even in ancient times, also included the air that people breathed, the language they spoke, the narratives that intergenerationally renewed their sense of identity and values, the craft knowledge and the technologies that have been refined over generations of living within the limits and possibilities of their bioregions, the norms and structures that were the basis of their decision-making process, their games as well as their forms of aesthetic expression, their knowledge of the medicinal properties of plants and so forth. In effect the commons encompassed every aspect of the human/biotic community that had not been monetized or privatized (Bowers 2006a: 2).

Among the cultural commons, Martusewicz et al. include "food cultivation and preparation, medicinal practices, language and literacy practices, arts and aesthetic practices, games and entertainment, craft and building knowledge, bartering, decision-making practices, and so on" (2011: 212). Furthermore, among the cultural commons are encompassed the languages, narratives, beliefs, and systems of values that influence the way human communities relate to the natural world. The commons can then be understood as a form of *wealth* in the community, available to all and shared in non-monetized ways, that helps ensure the subsistence and security of people while nurturing harmonious interactions with the environment.

The identification and definition of the commons, as well as the practices that preserve and regenerate them, are not universal but intimately related to particular places. They depend upon the geographical, historical, and cultural contexts of the communities. Hence, a place-based education that connects teachers and learners with the wider community in practices that foster a sustainable living is a powerful tool with which to identify, conserve, and regenerate the commons. In the following pages I will argue that the opposite is also true – educating for the commons in a way that connects teachers and learners with the wider community is a powerful tool that foster a sustainable living. Making of the commons the focus of education (see Bowers 2006b) allows for the cultivation of ecological literacy because the commons represents the *lived interdependence* that connects human and natural systems. In other words, learning about the central role of the commons for ecological sustainability involves understanding and acknowledging the ways in which we interact,

depend upon, and affect larger living systems (Martusewicz et al. 2011). In the following sections, I will adopt an ecojustice framework to explore how an educational focus on the commons can support the creation of human sustainable communities.

4.3.1 The enclosure of the commons

All cultures across the planet create and rely upon their commons (Bowers and Martusewicz 2009). While in the West cultural practices of the commons – when they have survived - date back to a time where life and the economy were more community-based, and are generally regarded as belonging to a past from which we have 'evolved', the "world's social majorities" (Esteva and Prakash 1998) still depend on the practices they have developed across generations to protect what they need from the natural world to survive: saving and exchanging seeds; protecting water sources and forests; nurturing the health of the soil through polycultures that feed both human and animals; conserving and transmitting knowledge about the medical properties of plants, and so forth. Understanding the nature and the importance of the commons in sustaining communities requires a close examination of the practice of *enclosure*, that is, the privatization and commodification of what was once freely shared. Such practice does not refer only to the physical enclosure – literally, putting a fence around – of the land, but to any privatizing of material and cultural resources that used to be available to all (The Ecologist 1994; Eisenstein 2011; Martusewicz et al. 2011).

Several authors have argued that the process of enclosure of the commons has played a crucial role, since the end of the 18th century, in providing the world's first urban workforce necessary to fueling the growth of the industrial capitalist economy, and is now driving the reforms of economic development adopted by 'underdeveloped' and 'developing' countries (Snyder 1990; Sale 1995; Esteva and Prakash 1998, Bauman 2005). Sale (1995) argues that the communally centered practices that ensured families self-sufficiency had to be abandoned in order for individuals to participate in the market economy as workers and consumers.

> All that "community" implies -- self-sufficiency, mutual aid, morality in the marketplace, stubborn tradition, regulation by custom, organic knowledge instead of mechanistic science -- had to be steadily and systematically disrupted and displaced. All of the practices that kept the individual from being a consumer had to be done away with so that the cogs and wheels of an unfettered machine called "the economy" could operate without interference, influenced merely by invisible hands and inevitable balances and all the rest of that

> benevolent free-market system. (Sale 1995:38; quoted in Bowers 2001:9)

By cutting people off the life-sustaining relationships of the commons, enclosure has allowed an exponential growth of the market and industrial production. People deprived of the means to sustain themselves became dependent on wages to meet the needs once ensured by the commons. Eisenstein (2011) explains how in present-day capitalist economies economic growth is directly linked to the enclosure of the commons. Whenever any aspect of nature or culture - what he refers as natural, cultural, social, and spiritual capital (2011: 69-92) - is turned into a commodity, so that it becomes available for consumption, the economy 'grows' because the realm of goods and services available on the market is expanded. Simply put, the success (*sic*) of our economy is predicated on the conversion of the common-wealth into money. In this sense, we can understand how the modern ideologies of progress and development demanded the privatization of the commons and the disruption of communities, both regarded then as signs of stagnation and backwardness. When the commons are enclosed by processes of privatization, they become sources of profit for the enclosers and remain no longer available to the people who relied on them unless for those who can pay.

In Western industrial cultures, where privatization and individual profits are taken-for-granted, enclosure is often justified by the assumption that if everybody can access resources these get inevitably depleted because individuals seek to maximize their self-interest at the expense of the common good. This belief, popularized in 1968 by Garrett Hardin's *The Tragedy of the Commons*, reveals nevertheless a misunderstanding. It looks at the natural commons – an over-grazed land in Hardin's case – as separated from and non-regulated by the practices of the cultural commons of the communities which depends upon them. A commons regime, in fact, is not characterized by the absence of regulation, but by the absence of property (The Ecologist 1994). Cultures across the planed have protected their commons through tradition, custom, and social pressure (Eisenstein 2011). As Elinor Ostrom (1990) have shown, cooperative community-based institutions organized and governed by the commons users represent successful alternatives to both centralized governmental control and private ownership which are able to guarantee equitable shares and to prevent indiscriminate individual appropriation. The risk of resource exhaustion, while nonetheless present, is controlled by the authority of the community through shared agreements that ensure that nobody owns while everyone benefits.

We can see therefore how practices of enclosure are more than just material processes of privatization and commodification. They rest upon culturally specific systems of values and ways of thinking that define humans as in control of and separated from natural systems (anthropocentrism), and whose nature and inalienable right is to maximize their self-interest (individualism); they include the belief that some people have more right than others in benefiting from common resources (etnocentrism, androcentrism, racism); and that the value of the things necessary to sustain human life is best expressed and defined in the marketplace (commodification, consumerism). As Martusewicz et al. posit, enclosure is "a process of exclusion created and kept in place by a complex cultural mindset that presents *hierarchical relationships of value* as natural" (2011: 215. Italics added). Thus, enclosure derives from and reinforces a way of thinking and perceiving the world – a worldview - that does not allow for the recognition and protection of the network of relationships that sustains us in interdependence with other living systems. As Bateson (1973) pointed out, this mindset undermines systemic wisdom – the recognition and the guidance by the knowledge of the ecology of relationships in which we are embedded.

It is important to be careful not to romanticize the cultural commons as being exclusively in support of communities and the environment. I am aware indeed of cultures that have developed complex ways of understanding and adapting successfully to the characteristics of their environment while also engaging in tremendous forms of social and class discrimination. The rejection of Western values does not always imply higher standards of social justice and environmental responsibility (Bowers 2006a). For example, traditions of exclusion or oppression against humans and animals, which are found not only of Western cultures, are themselves part of the cultural commons that people share. In the same way, we can understand that the modern ideas and discourses of anthropocentrism, individualism, progress, and so forth, also represent cultural commons that are reproduced and transmitted intergenerationally (ibid.). It is essential therefore to distinguish between traditions that are essential to sustain communities in harmony with their social and natural environment and those which may have long destructive impact[14].

14 Bowers (2003) refers to this attitude as "mindful conservatism" (see Part II p. 20)

4.3.2 Orienting education towards the regeneration of the commons

Shaped by the ideologies of modernization then and globalization now, the dominant model of formal education contributes largely to the further enclosure of the commons. By preparing the young with the knowledge and skills instrumental to participate in the consumer society, schools and university teach – as part of their hidden curriculum – that the commodification of the cultural and material resources necessary to sustain human life is inevitable, if not even a sign of progress. It normalizes enclosure as 'just the way it is'.

As for the development of ecological literacy and educational practices that support local places, rethinking education with focus on the commons requires a profound shift of perception and values. For this purpose, we can, once again, find inspiration from cultures that are protecting their commons and traditions against the homogenizing forces of the industrial-consumer lifestyle. But without having to go too far away from our places, we can start by identifying the commons that are still alive in our communities and join efforts to protect them. In order to do so, we need to challenge individualist, market-centered values such as efficiency, competition, growth, and personal profit and rediscover our sense of belonging and interdependence in the values of mutuality, trust, and cooperation as the basis of all human and human-environmental relationships. As suggested by the theory of ecojustice, the first step for revitalizing the commons is overcoming the cultural assumptions that cause and maintain its enclosure.

Orienting education towards the revitalization of the commons means to reclaim the commons as sources of teaching and learning. Contrary to the dominant vision promoted by schools and universities which disregards the value of local traditions and intergenerational knowledge, teaching for the commons asserts the need to “revalue and re-teach those forms of knowledge that offer a smaller ecological footprint and stronger communities” (Martusewicz et al. 2011: 275). Educating for the commons means to identify those traditions and practices in the day-to-day life that we need to conserve for sustaining communities in harmonious connection with the natural world, while diminishing our dependence on those that enhance separation and domination. In this direction, Bowers and Martusewicz (2009) suggest that the first step achievable by all teachers and educators is to focus students' attention during a typical day on the different activities and relationships that have been monetized. By recognizing how much of their daily life has been enclosed by market forces, students can easily identify those spaces, customs and practices that are still shared as part of the commons. Depending on their

cultural groups and bioregions, students can find in their families different forms of knowledge about food, entertainment, ceremonies, management of the household, relationships with neighbors, and networks of mutual support; among their peers, they can identify games, activities, and various forms of play and interaction that they share at different ages. Similarly, they can recognize those aspect of the natural and urban environment that have not yet been converted into exploitable resources: access to parks and green areas, use of public spaces, local decision-making processes, car-and-shops-free zones, healthy ecosystems, unpolluted air and water, and so forth.

To avoid falling trapped in a sense of powerlessness before the increasing predominance of the practices of enclosure, it is essential that teachers and learners engage in direct efforts to protect, regenerate, and create new spaces for the commons. In this sense, education for the commons is a form of experiential, place-based education because it looks at the local social and natural environment as the learning setting (commons as source of knowledge) and the beneficiary of students' work (revitalization of the commons as the goal of community efforts). The approach to the study of the commons is inherently multidisciplinary and allows for the integration of the content of traditional subjects with the study of local knowledge and traditions. By establishing networks of collaboration with different actors in the community, educational engagement with the commons fosters in students the development of practical competences such as participation, cooperation, and solidarity. Being more than simple words or slogans, these values need to be practiced and cultivated as lived experience.

The relevance of the commons for an education for a sustainable living rests ultimately in the fact, as emphasized by Bowers (2006a, 2006b), that the commons represent living alternatives to the consumer-dependent lifestyle which are accessible and shared by all people in all places. Keeping in mind that not all commons practices are ecologically benign, learning to distinguish between those that are in support of life and community and those that undermine them will help students to identify the aspects of the commons in their own communities and bioregions that are healthy and thus need to be conserved. In this respect, ecological literacy will both foster and be strengthened by the study of the commons. For its focus on the life-sustaining relationships that connect human and natural systems, it will play an important role in providing guidance toward wise choices that enhance sustainability. At the same time, students' direct experience of the importance of the commons for their life as individuals and community members will deepen the knowledge of their places and the comprehension of the

interrelatedness of life.

4.3.3 The commons as spaces of local autonomy and responsibility

Revitalizing the commons as sources of sustainable ways of living does not mean to 'go back' to the past, nor does it implies a rejection of modern technology and scientific knowledge in an effort to re-establish pre-industrial communities. This idea, which assumes that change is linear and progressive in nature, is neither desirable nor achievable. The point made in this work is that, in the face of the social and ecological uncertainties that accompany the global rush for endless change and development, traditions and practices of conservation and self-sufficiency are in urgent need to be regenerated. Revitalizing the commons means to learn from traditions and knowledge passed down across generations in order to integrate their valuable aspects with our present needs and understandings. Furthermore, the commons are not static, but evolve alongside changes in culture and landscapes, so that restoring the commons means to preserve spaces and practices of today, shared by people on a daily basis.

Schools and universities' efforts to revitalize the local commons require, as does the whole process of transition towards sustainability, the participation and involvement of the whole community. For this reason, reclaiming the commons means to assert the autonomy and capacity of local people to take decisions over the resources, spaces, and phenomena that affect the life of the community. It is not only a matter of protecting an ecosystem or preserving public spaces from becoming parking lots – it means to reclaim the *authority* to decide how and which ecosystem need to be protected, which is the best use for that public space, and so forth. The difference is substantial. It is not about demanding protection of the commons, but that decisions over the commons must be taken by those who rely on them for their livelihood. As we have seen, it is the sense of belonging and interrelatedness that preserves and renews the commons. Laws and an inculcated and abstract sense of 'the public' might not be enough. The struggle of many Indigenous peoples demonstrates that state control turns easily into a form of enclosure (see for example Gooch 1998; Esteva and Prakash 1998). The commons require local control because the commons, for the most part, are local. International and national governments should not administer any form of the commons that is inherently local or regional. Again, this does not deny the necessity of international or interregional agreements on issues that affect the commons on a global scale. Rather, it means to reduce communities' dependency on centralized – and thus easily controllable by corporate interests – decisions taken by people that are not affected by the problems that such decisions

may cause in local places. The so called 'tragedy of the commons', in fact, is nothing but 'the tragedy of enclosure' (Bromley 1991; in The Ecologist 1994). When a piece of land is privatized, the enclosers, unlike the people who rely on the health of the soil for their subsistence, can exploit and degrade it as long as it is profitable and then sell it on the global market without suffering from the consequences that such degradation causes to local ecosystems and communities. As The Ecologist puts it, “it is generally the enclosers rather than the commoners who benefit from bringing ruin to the commons” (1994: 113).

Reclaiming sovereignty on the commons implies therefore taking responsibility of human actions. Local control is more likely to prevent that decisions and practices undermine the well-being of the community, while external powers can enforce changes that take wealth away from the places where they are introduced without having to deal – that is, to experience in daily life – with the consequences of doing so. In other words, actions with destructive repercussions on local levels can be perpetuated as long as who carries them out is not impacted by them. We can understand therefore how responsibility over the actions that affect a system is a necessary condition for the sustainability of that system. As an essential part of wisdom, responsibility is better achieved on a scale that allows people to experience the consequences, positive and negative, of their decisions. Where people are directly dependent on their natural surroundings for their livelihood, they develop an intimate knowledge of those surroundings which inform their actions, that is, ecological literacy.

CONCLUSION

Find your place on the planet. Dig in, and take responsibility from there.
Gary Snyder

Hope is an imperative.
David Orr

Rethinking formal education on ecological values and perspectives is an act with profound political implications. Undoubtedly, it is a political action. Working together for changing how we think and relate to one another and the planet embodies a critique of the dominant

order and the resistance against its pressures. The creation of the alternative - when ideas materialize in tangible actions - carries forward the struggle against what we want to change.

Suggesting that schools and universities can become the vehicle through which reorient the human path away from disaster and towards permanent balance with the rest of nature may be interpreted by some as being utopic, if not merely naive. As Bowers ironically notes, it is "like suggesting that the Congress will protect the interests of the people instead of the interests of the corporations" (2006a: 85). How can educational institutions, given their manifest bonds with economic growth agendas and market needs, possibly revalue the knowledge of local places and contribute to the creation sustainable human communities? How can they cultivate in students the values of solidarity and interdependence when they teach them to compete since early age? How can they serve diversity and community if they promote standardized, and decontextualized knowledge? How can they possibly change an unsustainable culture when they contribute to reproduce that culture?

The challenge is big and, as I have tried to show, will require radical shifts. But we are not doomed. Recognizing that the changes we need are radical should not halt us – the solutions we need are radical because what we are doing to ourselves and the planet is radical. Literally, it means that we need to address the problems at their roots, understand where they come from and how they originate, how they are reproduced and maintained in place in ways that they become part of reality and thus normalized. From here, we need to imagine and implement strategies that do not aim just to 'fix' the problems, but that create new conditions where such problems can no longer arise. As Wendell Berry (1982) puts it, the goal is not the cure; the goal is *health*. Fully aware of the magnitude of the challenges we are facing, I do believe that in education lies our greatest hope. Not in schools as they are now, but in rethinking the content, the process, and the purpose of schooling. While "the problems of modern societies are institutionalized into schooling and thus passed down onto future generations via education" (Lupinacci 2013: 98), schools represent nevertheless spaces that offer the possibility to de-construct those problems and to work for their solution. The school, Orr writes, "is only an accomplice in a larger process of cultural decline. Yet no other institution is better able to reverse that decline" (2004: 25) My hope in rethinking education is that new generations will not have to *un*-learn what now is taught as 'normal', but will possess the wisdom necessary to find their health and security in connection with other living systems, and not anymore in their control and subjugation.

This research emphasizes the importance of looking at the ecological crisis as a human crisis of perceptions and values. Its origins, however, cannot be found in a supposedly universal human nature, but in the history of Western civilization. Through this lens, we can understand how the instrumental and exploitative relationship with nature characteristic of the current industrial consumer civilization is not inevitable nor immutable; on the contrary, as the outcome of culturally specific ways of thinking and perceiving the world, it can be changed. This work ascribes the causes of the crisis, and the inability of our political and economic institutions to respond to it, to deeply rooted epistemological misunderstandings of the relationships that connect human beings with their environment – namely, that humans are autonomous agents separated and morally superior to the objects of the environment with which they interact. Such errors, which lie at the basis of the Western anthropocentric-individualistic worldview, are rationalized through hierarchical systems of values which lead to perceive what is 'outside' the human realm as less entitled of ethical consideration, and thus at the mercy of human interests. Ultimately, this set of beliefs does not allow for the recognition that human well-being depends upon understanding our embodiment and participation in larger living systems. It undermines ecological wisdom.

Hence, if the causes of socially and ecologically destructive behaviors are largely cultural, the challenge of building sustainable human societies requires orienting educational institutions toward the transmission of values, knowledge, and practices that are truly sustainable – that is, that embody the awareness of human interrelatedness and interdependence with the rest of nature. The ecological understanding of life, well known to Indigenous cultures and spiritual traditions, is gradually taking place within the scientific community and its influence on academic research is leading an increasing number of scholars to work for educational reforms that are founded on ecological perspectives. *Ecojustice* theory offers a conceptual framework for understanding how the systems of beliefs, values, and the attached norms of behavior of human cultures interact with the larger systems of the more-than-human world. By analyzing the deep cultural assumptions that underlie the modern quest to dominate nature and the drive to endless change and progress, ecojustice advocates for educational practices that cultivate in students the capacity to recognize what need to conserved and what needs to be changed for sustaining human cultures in harmony with ecosystems. Acknowledging that every prospect of successful transition towards a sustainable living requires the engagement and participation of an ecologically competent population, it is essential that schools at all

levels foster the development of *ecological literacy* – the understanding of the basic principles of ecology together with a profound sense of care and respect for nature, through an experiential, multidisciplinary, and place-based approach to learning. Through ecological literacy we can join the understanding of how nature sustains life with the local knowledge that has sustained people across generations in order to design human communities integrated in the ecologies of their places. *Place-based education* is an approach to teaching and learning that aims to connect schools with the social and ecological context of their communities. By expanding the learning setting beyond the walls of the school, it engages students in experiential, real-problem solving activities that have a direct benefit for the community while cultivating civic participation, responsibility, and a sense of belonging to the places students inhabit. Anchoring education to the stewardship of local places is a way to reclaim the capacity and autonomy of people to create solutions to the events that affect their lives against the dependence on centralized decisions and the imposition universal recipes of development. Making of the revitalization of the *commons* the focus of education means to strengthen those traditions, practices, forms of knowledge, spaces, and ecosystems that are sources of self-and-community-reliance and represent living alternatives to the industrial-consumer lifestyle. Educating for the commons represents an experiential, place-based approach to learning that fosters local cultural and biological diversity, and the understanding of the interrelationships among humans and the natural world.

By rethinking education we can recover the ecological wisdom necessary to live sustainably. We can teach ourselves to perceive, to experience, the connectedness and interdependence of life and learn how to model human communities after this understanding. In other words, we can adopt a new worldview. However, an ecological education alone will not change much. Indeed, it is part of a larger process of cultural change which needs to involve all the institutions of our societies. As it has been argued, sustainability is not an individual property, but a property of the entire web of relationships, and it always involves a whole community. Efforts in education must be supported by different actors in the community and vice versa. For this reason, as noted by Capra (2009), ecological literacy must become a critical competence for people working in all fields, from politicians and business leaders to farmers, professionals, researchers, and so forth. If rethinking education on ecological basis may be not enough, it is, nevertheless, a necessary condition for a citizenry that is prepared and willing to work for sustainability.

In order for an ecological education to replace the current model, teachers at all levels need to be trained with the knowledge and competence necessary for such task. Indeed, teachers ecological education is the first necessary step for introducing in schools educational practices for a sustainable living. As argued by Smith and Williams, "one of the challenges of the coming decade[s] will be reshaping teacher education to acknowledge the far-reaching changes that must be made if our culture must become ecologically sustainable" (1999: 179). While the necessity of starting from teacher education is undoubted, it is important to keep in mind that the promotion of practices for a sustainable living does not have to be relegated to educational institutions alone. On the contrary, it is part of our commons – we all share with teachers the responsibility to support one another in developing our talents and potentials in ways that, recalling Bateson, benefit not only us, but *us-in-our-environment*. The means to do this do not lie only upon formal education. Educating ourselves to live sustainably is a shared effort we need to re-take control over and protect against institutional forms of enclosure. No-schooling, home-schooling, free schools, parents-and-community-driven education, after-school activities, and other spontaneous practices of informal education are valuable alternatives equally capable to educate for sustainability. Diversity of approaches and pedagogies is the safest insurance against the imposition of a single set of understandings and way of living.

The research started with this work does not end here. The theoretical framework of ecological education outlined in this thesis is being adopted in multiple ways and in the most diverse contexts by teachers and educators around the world committed to ensure our children a sustainable future. The following step will be studying and closer analyzing educational experiences, in both public schools and intentional communities, that are founded on ecological perspectives and practices so as to contribute to and expand the existing literature, which so far is based mainly on the work of North American scholars. By connecting and sharing these experiences, such study could further support the creation of a movement of schools, universities, as well as teachers, parents, and students, which can work as a network – a community – where people learn from and help one another, share knowledge and resources, and bring hope to our common future.

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