

# **Biocultural Ethics: Recovering the Vital Links between the Inhabitants, Their Habits, and Habitats**

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Biocultural homogenization involves three major drivers: (a) the physical barrier to everyday contact with biodiversity derived from the rapid growth of urban population, (b) the conceptual barrier derived from the omission in formal and non-formal education of native languages that contain a broad spectrum of traditional ecological knowledge and values, and (c) political barriers associated with the elimination or reduction of the teaching of ethics under the prevailing neoliberal economy governance since the 1960s. Biocultural ethics aims at overcoming these barriers by recovering the vital links between biological and cultural diversity, between the habits and the habitats of the inhabitants. These links are acknowledged by early Western philosophy, Amerindian traditional ecological knowledge, and contemporary ecological and evolutionary sciences, but have been lost in prevailing modern ethics. There is an overlooked diversity of forms of knowing and inhabiting regional ecosystems, each of them having diverse environmental and social consequences. A better understanding of the regionally diverse mosaics of ecosystems, languages, and cultures facilitates the distinction of specific causes and responsible agents of environmental problems, and the disclosure of sustainable practices, forms of ecological knowledge and values that offer already existing options to solve socio-ecological problems.

## **I. INTRODUCTION**

Modern ethics has decoupled human habits from the habitats where they take place, as if humans and their identities could exist in isolation from their habitats and other-than-human co-inhabitants. The conceptual omission of the links between habitats and habits has further sustained a Eurocentric approach projected onto the colonies with minimal consideration for the native ethos: as if indigenous ethics, and their intricate links with their habitats, would not exist or would be irrelevant. The lack of consideration for the ecological and cultural diversity, and their interrelationships in the heterogeneous regions of the planet, has been leading to a process of biocultural homogenization, which represents a major driver of losses

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of sustainability on regional and planetary scales. To discuss the types of global environmental change questions that demand further teamwork and interdisciplinary integration between philosophers and ecologists, the Cary Institute of Ecosystems Studies in Millbrook, New York, in partnership with the University of North Texas and the Chilean Institute of Ecology and Biodiversity, organized the fourteenth Cary Conference titled “Linking Ecology and Ethics for a Changing World: Values, Philosophy, and Action” in May 2011. An earlier version of this paper was presented at that conference,<sup>1</sup> and its central thesis is that to develop a philosophical approach that re-couples the habits of the inhabitants with the habitats they inhabit represents a central task for contemporary environmental ethics, in order to promote the well-being of the diverse human and other-than-human co-inhabitants.

A biocultural ethics demands a better distinction between specific responsible agents of environmental problems and a clearer understanding about the diversity of existing sustainable forms of ecological knowledge, practices, and worldviews that have co-evolved within specific ecoregions. At the same time, biocultural ethics fosters a greater integration of biological and cultural diversity in education programs, policy making, and everyday life to counterbalance the losses of options for environmental and social sustainability, and the linguicide, biocide, and increasing poverty associated with biocultural homogenization.

I first discuss biocultural homogenization, analyzing major physical, conceptual, and political barriers that prevent an ethical understanding and valuation of biocultural diversity in contemporary global society with a focus on South America. Then I examine biocultural ethics and its foundations provided by ancient Western philosophical and Amerindian worldviews, and contemporary ecological sciences. Finally, based on our work in southern South America, through the Subantarctic Biocultural Conservation program coordinated by the University of North Texas in partnership with the Chilean Institute of Ecology and Biodiversity and the University of Magallanes, I introduce the field environmental philosophy methodological approach to foster a biocultural ethics on regional and international scales.

## II. BIOCULTURAL HOMOGENIZATION

In a recent special issue of *Environmental Ethics*,<sup>2</sup> which was the result of a workshop called “Integrating Ecological Sciences and Environmental Ethics into Biocultural Conservation” held in southwestern South America, we described in one of the articles how citizens in the southernmost city of the world, Puerto Williams, most commonly named apples and roses when asked which plants came first to

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<sup>1</sup> An edited book based on the Fourteenth Cary Conference will include the overall perspectives, brief individual presentations, and other outcomes of the conference.

<sup>2</sup> For a summary of the goals and presentation in the workshop, see Ricardo Rozzi, Juan J. Armesto, and Robert Frodeman, “Integrating Ecological Sciences and Environmental Ethics into Biocultural Conservation in South American Temperate Sub-Antarctic Ecosystems,” *Environmental Ethics* 30, no. 3 (2008): 229–34 and other articles in the issue.

their minds.<sup>3</sup> Puerto Williams is the capital of the Antarctic Province of Chile in the Cape Horn Biosphere Reserve, and roses and apples do not grow in the austral region. Nevertheless, they dominate the botanical mindsets of the austral teachers and government authorities who educate the children and make decisions about development options for the vast Antarctic territory and the southernmost region of the Americas. This region represents a planetary hotspot of biodiversity for mosses, liverworts, and other little flora.<sup>4</sup> However, teachers and authorities have little or no knowledge about this regional subantarctic flora. Instead, they teach and develop educational policies based on roses, apples, palms, and other exotic plants that are taught today in most textbooks and school curricula in Chile, other South American countries, North America, and Europe.<sup>5</sup> In other words, the case of dissociation between the floristic mindsets and the actual regional flora found the remote city of Puerto Williams is not an isolated case. On the contrary, it illustrates the extent of a process that takes place throughout South America, and can be called biocultural homogenization.<sup>6</sup>

The process of biocultural homogenization entails simultaneous and interdigitated losses of native biological and cultural diversity at local, regional, and global scales. This process leads to the disruption of the interrelationships between cultures and their land, and results in the massive replacement of native biota and cultures by cosmopolitan species, languages, and cultures. During the past three decades, biotic homogenization and cultural (including linguistic) homogenization processes have been independently investigated.<sup>7</sup> A biocultural perspective integrates them to investigate the interrelated causes and feedbacks between the processes of biotic,

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<sup>3</sup> More than sixty percent of the plants named by people interviewed in Puerto Williams in the year 2000 were species that were exotic to the subantarctic ecoregion. For details on the study, see Ricardo Rozzi, Ximena Arango, Francisca Massardo, Christopher Anderson, Kurt Heidinger, and Kelli Moses, "Field Environmental Philosophy and Biocultural Conservation: The Omora Ethnobotanical Park Educational Program," *Environmental Ethics* 30, no. 3 (2008): 325–36.

<sup>4</sup> See Ricardo Rozzi, Juan J. Armesto, Bernard Goffinet, William Buck, Francisca Massardo, John Silander, Mary Kalin-Arroyo, Shaun Russell, Christopher B. Anderson, Luis Cavieres, and J. Baird Callicott, "Changing Lenses to Assess Biodiversity: Patterns of Species Richness in Sub-Antarctic Plants and Implications for Global Conservation," *Frontiers in Ecology and the Environment* 6 (2008): 131–37.

<sup>5</sup> See Ricardo Rozzi and Francisca Massardo, "Implicancias ecológicas y sociales de la bioingeniería: un análisis desde el sur de Latinoamérica," in Teresa Kwiatkowska and Jorge Issa, eds., *Ingeniería Genética y Ambiental: Problemas Filosóficos y Sociales* (Mexico: Editorial Plaza y Valdes 2000), pp. 187–207.

<sup>6</sup> For a more elaborated definition and specific cases of biocultural homogenization, see Ricardo Rozzi, Francisca Massardo, John Silander Jr., Christopher Anderson, and Andres Marin, "Conservación biocultural y ética ambiental en el extremo austral de América: oportunidades y dificultades para el bienestar ecosocial," in Eugenio Figueroa and Javier Simonetti, eds., *Biodiversidad y Globalización* (Santiago, Chile: Editorial Universitaria, 2003), pp. 51–85.

<sup>7</sup> For studies on biotic homogenization, see M. L. McKinney and J. Lockwood, "Biotic homogenization: A Few Winners Replacing Many Losers in the Next Mass Extinction," *TREE* 14 (1999): 450–53; J. Olden and T. Rooney, "On Defining and Quantifying Biotic Homogenization," *Global Ecology and Biogeography* 15 (2006): 113–20. For studies on linguistic and cultural homogenization see A. Petitat,

linguistic, and cultural homogenization. Biocultural homogenization represents a major, but often underappreciated driver of today's rapid global environmental change.

Why is it that authorities and other people around the globe have so many difficulties perceiving, understanding, and appreciating biological and cultural diversity today? I distinguish two main types of barriers that drive the rapidly growing homogenization of the habits and habitats inhabited by people worldwide. Contemporary global society is characterized by an explosive growth of urban population, which leads to a drastic homogenization of the habitats inhabited by most humans. First, the urban enclosure of contemporary society generates a physical barrier that hinders the awareness and understanding of biocultural diversity. Second, urbanization generates a technosphere which reduces the diversity of languages, forms of ecological knowledge, and political organization.<sup>8</sup> These barriers synergically foster biocultural homogenization.

#### PHYSICAL BARRIERS

At the beginning of the twenty-first century, for the first time in the history of the human species, more than fifty percent of the world's human population lives in cities.<sup>9</sup> The intensive rural to urban migration is a very recent and explosive phenomenon, which affects mostly young generations. Until the mid-twentieth century more than seventy percent of the world population still lived in rural areas. After World War II, the new development agenda impelled an intensive process of rural-urban migration worldwide, which will lead to a mirror image by the middle of the twenty-first century, when seventy percent of the world population will be urban (Figure 1).<sup>10</sup>

Latin America is the continent that hosts most of the world's recorded biodiversity.<sup>11</sup> This continent hosts also the largest cities of the Americas, Mexico City and Sao Paulo, with more than twenty million inhabitants each. During the last half of the twentieth century, the rural-urban migration has been especially notable in

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"School and the Production of Society," *British Journal of Sociology of Education* 8 (1987): 379-90; F. Rizvi and B. Lingard, "Globalization and Education: Complexities and Contingencies," *Education Theory* 50 (2000): 419-26; J. R. Short, A. Boniche, Y. Kim, and P. Li, "Cultural Globalization, Global English, and Geography Journals," *The Professional Geographer* 53 (2001): 1-11.

<sup>8</sup> *Technosphere* is a term coined by ecologist Zev Naveh. See his article "From Biodiversity to Ecodiversity: New Tools for Holistic Landscape Conservation," *International Journal of Ecology and Environmental Sciences* 21 (1995): 1-16.

<sup>9</sup> Christopher Flavin, "Preface," in L. Starke, ed., *State of the World 2007: Our Urban Future* (Washington, D.C.: Worldwatch Institute 2007), pp. xxiii-xxv.

<sup>10</sup> World Urbanization Prospects: The 2007 Revision Population Database, United Nations, Population Division, New York (<http://esa.un.org/unup>).

<sup>11</sup> See Sergio Guevara and Javier Laborde, "The Landscape Approach: Designing New Reserves for Protection of Biological and Cultural Diversity in Latin America," *Environmental Ethics* 30, no. 3 (2008): 251-62.

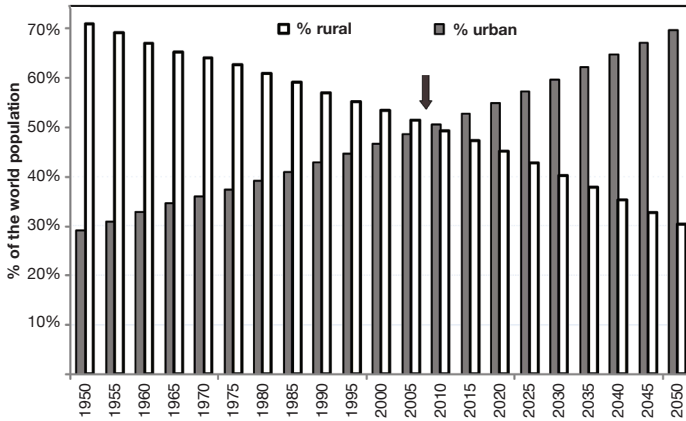


Fig. 1. Relative percentages of rural and urban world population since 1950 (seventy percent rural vs. thirty percent urban), including estimated percentages until 2050 (thirty percent rural vs. seventy percent urban). The arrow indicates the turning point in 2007 when, for the first time in human history, the proportion of urban population surpassed the rural one. (Data obtained from the reference in note 10.)

Latin America, growing from forty-one percent in 1950 to seventy-five percent in 2000.<sup>12</sup> Hence, Latin America is ahead of the rest of the world regarding the rapid enclosure of humans within cities. The sudden concentration of human population in cities has had drastic consequences for both (a) native habitats and (b) the human inhabitants in Latin America.

(a) For native habitats, the rural-urban migration has generated a loss of the ancestral human stewards, or guardians, of the land. As native people and long established peasant communities migrate to cities, the tropical rain forest, high Andean paramo, the temperate forests, the subantarctic moorlands and coastal ecosystems in South America are left open to accelerated processes of land-use changes, including large scale mining, expansion of monocultures, and concentration of the ownership of real property.<sup>13</sup> During the last five decades, Latin American governments have been subject to an increasingly prevailing neoliberal economic, development model, which, driven by narrow technological and market parameters, has promoted the consolidation of land ownership in service of economies of scale. Both national and international development pressures act over regional habitats displacing and/or eliminating their native human populations. The explosive increment in the concentration of land ownership since the 1970s has had severe

<sup>12</sup> Data from Boletín Demográfico de enero de 2003, Santiago, Chile: CEPAL.

<sup>13</sup> Cf. Ricardo Rozzi, "Ética ambiental: raíces y ramas latinoamericanas," in Richard Primack, Ricardo Rozzi, Peter Feinsinger, Rodolfo Dirzo, and Francisca Massardo, eds., *Fundamentos de Conservación Biológica: Perspectivas Latinoamericanas* (Mexico D.F.: Fondo de Cultura Económica, 2001), pp. 311–59.

negative socio-ecological impacts.<sup>14</sup> Regions such as the Amazonian rain forests and the high-Andean plateaus have been subject to recurrent illegal deforestation and mining pollution that violate national environmental laws and override the will of many rural and indigenous populations.<sup>15</sup> For example, the U'wa people inhabit the foothills and cloud forests of the Andes in northeast Colombia, and had almost no contact with the outside world until forty years ago. In 1991, oil company Oxy (Occidental) signed an exploration permit with the Ministry of the Environment in Colombia.<sup>16</sup> The U'wa believe that oil is the blood of the mother Earth, and when threatened by oil drilling against their wishes, in 1995 the U'wa said that if Oxy drills they would commit collective suicide. The disputes continued for over a decade with several U'wa children murdered in 2000. Colombian environmental sociologist Isaías Tobasura Acuña concludes that the U'wa case demonstrates once again that the stated Colombian national environmental policy is not an instrument that actually serves the purposes for which it was intended—social well-being among its purposes—because it is continuously overridden by national and international economic power.<sup>17</sup> Other cases in Latin America have shown that an effective strategy to stop some violations of environmental regulation is to form alliances with international media. For example, Tarahumara indigenous people from the Sierra Madre in northern Mexico marched to the city of Chihuahua to protest illegal deforestation that was a risk to their water resources, and thereby the capacity of the mothers to produce milk for their children. Women marching with their babies through the streets of Guadalajara were graphically portrayed by US journalist Wesley Boxley in 1999, and the illegal deforestation was stopped three months afterwards.<sup>18</sup>

Manifold cases like the former ones show that Amerindian and other local populations are keenly aware that well-being of human communities and other-than-human communities go hand in hand. In their territories, these populations frequently act as guardians of the land, protecting its biological and cultural diversity. They attempt to resist their territorial displacements caused by development projects such as mining, dams, and monocultures, in order to conserve their autonomy, their traditional habits, and habitats.<sup>19</sup> Biocultural ethics emphasizes that conservation

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<sup>14</sup> Cf. Amos Nascimento, "Environmental Philosophy in Brazil? Theoretical and Practical Reflections on a South American Question," *International Society for Environmental Ethics Newsletter* 21, no. 1 (2010): 7–22.

<sup>15</sup> Eliane Cecon and Octavio Miramontes, "Mechanisms and Social Actors in the Deforestation of the Brazilian Amazon," *Interciencia* 24, no. 2 (1999): 112–19.

<sup>16</sup> See Isaías Tobasura Acuña, "Ambientalismo y Ambientalistas. El Ambientalismo Criollo a Finales del Siglo XX," *Universidad de Caldas, Colombia, Cuadernos de Investigación*, no 21 (2006).

<sup>17</sup> *Ibid.*

<sup>18</sup> Cf. Ricardo Rozzi, "Ética ambiental: raíces y ramas latinoamericanas," in Primack et al., *Fundamentos de Conservación Biológica*, p. 314.

<sup>19</sup> An encompassing collection of essays about the interrelations between poverty and environment in Latin American countries is presented by Ernesto Hajek, ed., *Pobreza y Medio Ambiente en América Latina* (Buenos Aires: Centro Interdisciplinario de Estudios sobre el Desarrollo Latinoamericano, 1995).

should not be considered merely a luxury of rich people and rich nations. Instead, it is a vital need for the health of the local inhabitants and their culture.<sup>20</sup>

(b) For the human inhabitants, the rural-urban migration in Latin America has resulted in many populations losing everyday contact with their regional biological and cultural diversity. Regional ecosystems become distant regarding the everyday experience, but they are heavily impacted by new urban lifestyles, with growing levels of energy and material consumption, and production of waste. Hence, losses of regional biological and cultural diversity are coupled with degradation of environmental and social sustainability. On the one hand, a drastic consequence for most of the displaced rural populations is that their sustainable biocultural relationships with their ancestral lands are interrupted. On the other hand, in the cities, displaced indigenous people, peasant and fishermen communities frequently lose access to basic needs, such as food, water, shelter, and sanitary conditions. They suffer severe decreases in their qualities of life, and face conditions of extreme poverty that are rapidly expanding scope and worsening in marginal neighborhoods of metropolitan areas. Based on their work with poor women, leading South American ecofeminists and liberation theologians, Ivone Gebara (Brazil) and Gladys Parentelli (Uruguay-Venezuela) have called attention to the daily lives of women in slums, showing the ways that the exclusion of the poor is linked to the destruction of their lands. This approach concurs with the perspective that in Latin America the most negative impacts of environmental degradation affect poor people. They are the main victims, not the agents of such degradation.<sup>21</sup>

Additionally, for both the displaced communities and the affluent urban society, the accelerated rural-urban migration has generated a physical barrier that obstructs their contact with the regional habitats, and also with the habits of communities that have inhabited these habitats for generations. To city dwellers in Latin America, the peculiar languages, ecological knowledge, and practices of regional communities remain even less visible than the vast biological diversity of Amazonas, Pantanal, or the high Andes. In the current global society, the knowledge that most teachers, authorities, new generations of students, and the large majority of citizens have about biological and cultural diversity is acquired in urban contexts, distanced physically, emotionally, and ethically from the regional habitats and human habits that harbor most of the world's biological and cultural diversity. Today, direct exposure to the native regional habitats, and the beauty and diversity of their human and other-than-human co-inhabitants, has become an increasingly rare experience

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<sup>20</sup> See Rozzi, "Ética ambiental."

<sup>21</sup> See Gladys Parentelli, "Latin America's Poor Women," in Rosemary R. Ruether, ed., *Women Healing Earth: Third World Women on Ecology, Feminism, and Religion* (Maryknoll, N.Y.: Orbis Books, 1996), pp. 29–38. Ivonne Gebara, *Longing for Running Water: Ecofeminism and Liberation* (Minneapolis: Augsburg Fortress Press, 1999); Ricardo Rozzi "South America Environmental Ethics," in J. Baird Callicott and Robert Frodeman, eds., *Encyclopedia of Environmental Ethics and Philosophy* (Detroit: Cengage Learning, 2008), vol. 2, pp. 262–68.

in lives and formal education of people worldwide, and Latin America is not free of this trend.<sup>22</sup>

CONCEPTUAL AND POLITICAL BARRIERS

At the beginning of the twenty-first century, for the first time in the history of the human species, more than half of the world’s population inhabits symbolic worlds that are defined by less than ten languages. According to the data of the Ethnologue (2009), today fifty-two percent of the world population speaks one of the seven of the dominant languages: Mandarin, English, Hindi, Spanish, Russian, Arabic, and Bengali (Figure 2).<sup>23</sup> These seven languages represent only a minimal fraction (0.1%) of the 6,909 languages that are still spoken around the globe. This linguistic homogenization drastically reduces the spectrum of concepts and worldviews with which biological and cultural diversity are perceived, understood, and valued.

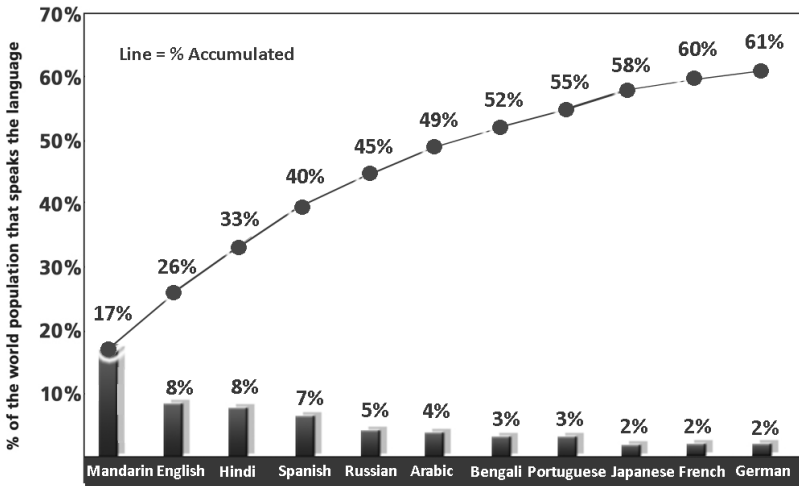


Fig. 2. Dominant Languages Spoken in the World in 2000. Bars illustrate the relative percentage of the world population that speaks each of the dominant languages, and the line depicts the accumulated percentage of the world population that speaks one of these languages. (Data obtained from Ethnologue 2010).<sup>24</sup>

<sup>22</sup> Cf. Peter Feinsinger, Laura Margutti, and Ramona Oviedo, “Schoolyards and Nature Trails: Ecology Education Outside the University,” *Trends in Ecology and Evolution* 12 (1997): 115–120; Carl Leopold, “Living with the Land Ethic,” *BioScience* 54 (2004): 149–154; Richard Louv, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder* (New York: Algonquin Books, 2005).

<sup>23</sup> Paul M. Lewis, ed., *Ethnologue: Languages of the World*, 16th ed. (Dallas, Tex.: SIL International 2009). Online version: <http://www.ethnologue.com>.

<sup>24</sup> Ethnologue Online (<http://www.ethnologue.com>).



Moreover, in formal education worldwide, less than ten percent of the living languages are taught around the planet.<sup>25</sup> In this way, formal education represents a central indirect driver of languages and cultural diversity losses.<sup>26</sup> This severe linguistic homogenization reduces the spectrum of both forms of ecological knowledge and environmental ethics. In Latin America, indigenous languages have been completely ignored or only marginally incorporated into the formal education system. Most Latin American countries became independent from Spain between 1810 and 1830. However, in these countries Spanish was maintained as the unifying language of the young nation-states. Formal education began to include Amerindian populations in the early twentieth century. The central goal was the linguistic, cultural, and political assimilation of the indigenous populations by the nation-state. Consequently, monolingualism prevailed in formal education of the whole continent during the twentieth century. This is also true for Brazil, in which Portuguese is the single language of formal education. Linguistic diversity is even more endangered than biological diversity in this continent.<sup>27</sup> For example, fifty percent of the native languages that were spoken in Chile at the arrival of the Spanish are already extinct.<sup>28</sup>

Since the 1970s, several Latin American countries are making efforts to recover indigenous languages and cultures.<sup>29</sup> However, today the knowledge that most people have about biological and cultural diversity is acquired through books, computers, and audio-visual media based primarily on only a few imperial languages, including English, German, and French in addition to Spanish and Portuguese. In addition, during the last few decades, under the neoliberal regime, the emphasis on modern sciences and mathematics in formal education to describe and investigate natural phenomena has been strongly influenced, and narrowed, by economic metaphors and models for interpreting ecological and social reality. In terms of the Chilean philosopher Jorge Larraín, the Latin American nation-states have transitioned from a period of modernization to one of “monetarization.” The narrow spectra of

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<sup>25</sup> Cf. Michael Krauss “The World’s Languages in Crisis,” *Language* 68 (1992): 4–10; Luisa Maffi, ed., *On Biocultural Diversity: Linking Language, Knowledge, and the Environment* (Washington, D.C.: Smithsonian Institution Press, 2001).

<sup>26</sup> Cf. Luisa Maffi, “Linguistic, Cultural, and Biological Diversity,” *Annual Review of Anthropology* 34 (2005): 599–617.

<sup>27</sup> See Manuel Lizarralde, “Biodiversity and Loss of Indigenous Languages and Knowledge in South America,” in Luisa Maffi, ed., *On Biocultural Diversity: Linking Language, Knowledge, and the Environment* (Washington, D.C.: Smithsonian Institution Press, 2001), pp. 265–81.

<sup>28</sup> See Rozzi et al., “Conservación biocultural y ética ambiental.”

<sup>29</sup> One major step toward multilingualism is represented by the creation of the “Dirección General de Educación Indígena” (General Division of Indigenous Education) in Mexico in 1973. The Mexican educational law of 1973 recognized fifty-six indigenous languages, and stated explicitly that the teaching of Spanish should not occur to the detriment of the linguistic and cultural identities of indigenous school children. Similar educational reforms have taken place in Argentina, Bolivia, Brazil, Colombia, and Ecuador. However, multilingual indigenous education reaches only a minimal fraction of the indigenous populations, and it is restricted almost exclusively to primary education. See “La educación intercultural bilingüe en América Latina: balance y perspectivas,” by Luis Enrique López and Wolfgang Küper, *Revista Iberoamericana de Educación* 20 (1999): 17–85.

languages and the pervasiveness of economic models in the culture of free-market global society have reduced nature and biodiversity to mere “natural resources.”<sup>30</sup> This notion prevails in primary, secondary, and higher education. It shapes how biodiversity is perceived, managed, and valued. However, it markedly contrasts with the many Amerindian languages and ecological worldviews that are still alive. These languages and worldviews emphasize instead a sense of kinship and community among humans and other-than-human beings.<sup>31</sup>

Philosophy, and specifically environmental philosophy,<sup>32</sup> could play a major role in overcoming the narrowness of the prevailing economic language and formal education in Latin America. However, the role that philosophy has played in Latin American education was severely curtailed during the 1960s, 1970s, and 1980s. Under the rule of military dictatorships, during that period the teaching of ethics and philosophy was suppressed and/or drastically reduced in the primary, secondary, and higher education curricula in many Latin American countries. For example, in Chile after the military coup in 1973, all university programs in philosophy were closed, many faculty were prosecuted, or exiled, and entire collections of books on art and humanities were burned and banned in the libraries of the main universities. Sadly, an infamous moment in Chilean history took place a few weeks after the military coup, when in the evening news program, the National TV channel showed a book burning at the University of Chile in which a military official declared: “in these moments you can see how we are burning all the literature about Cuba, here we are burning the cubism of Miró, Picasso. . . .”<sup>32</sup> This brutal silencing of culture

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<sup>30</sup> The prevalence of economic language does not only affect Latin America. See Eugene Hargrove, “A Traditional and Multicultural Approach to Environmental Ethics at Primary and Secondary School Levels,” *Environmental Ethics* 30 (2008): 263–71.

<sup>31</sup> See the rich series of books, *The Folk Literature of South American Indians*, which encompasses ecological narratives of thirty-one indigenous cultures, edited by UCLA anthropologist Johannes Wilbert, and published by the University of California Press. For a worldwide picture of ecological worldviews, see J. Baird Callicott, *Earth's Insights: A Multicultural Survey of Ecological Ethics from the Mediterranean Basin to the Australian Outback* (Berkeley: University of California Press, 1997).

<sup>32</sup> Quote from “Historia Política de Chile y su Evolución Electoral (desde 1810 hasta 1992)” by Germán Urzúa Valenzuela (Santiago: Editorial Jurídica de Chile, 1992). In his book, the lawyer Urzúa Valenzuela also refers to similar cases in other Latin American countries ruled by military dictatorships. He cites Edgar Montiel, Peruvian philosopher and economist, writing that “The lack of culture of the dictators is as grotesque as dramatic. Alejo Carpentier told us that the dictator Machado (1928) had ordered to confiscate ‘red books’; well, among the confiscated books . . . was *Red and Black* by Stendahl, *The Knight of Maison-Rouge: A Novel of Marie Antoinette* or *The Knight of the Red House* by Alexander Dumas, *The Red Lily* by Anatole France. . . . *The Red Hood*. And they forgave as a “religious book” *The Holy Family* by Engels. . . . Fifty years later the sinister intelligence services ordered to collect all the literature about ‘cubism,’ because as they said, it was about a movement of ‘Castrist painters” (p. 716). Regarding Chile, Urzúa Valenzuela emphasizes that “the national authorities appointed by Pinochet, tried to fight “the Marxists” going to the source of Marxist literature in any possible way; that is, they stated the destruction of all that “on their judgment, have the serious transgression to be a political thought.” Among many examples, registered how “until 11 September 1973 [military coup date]. The School of Administrative and Political Sciences (Escuela de Ciencias Políticas y Administrativas) was part of the Faculty of Law of the University of Chile (Facultad de Derecho de la Universidad de Chile). Immediately after the military coup, this school was part of the Economy School (Escuela de Economía), and its just appointed dean ordered the total destruction of all books with some relation with

in general and of the teaching of philosophy in formal education (at the school and university level) in particular, together with the imposition of an omnipresent neoliberal economic discourse, sent the philosophical vocabulary and praxis in Chile and other Latin American countries into oblivion.<sup>33</sup>

The interruption of the teaching of philosophy in the Chilean academy lasted for about a decade. This prohibition started to be overcome, with difficulty, at the beginning of the 1980s, when the *Pontificia Universidad Católica de Santiago de Chile* inaugurated an evening certificate program in philosophy for professionals and students. Later in the middle of that decade, the *Facultad de Filosofía y Humanidades de la Universidad de Chile* reopened its doors.

The reopening of the philosophy programs, however, did not remove the barrier to understanding the interrelationships between the regional habitats and the habits of the inhabitants, because ethics began to be prevalently taught with Eurocentric perspectives. Consequently, philosophy programs in the post-dictatorship academy, neither emphasized ecological, social, political, economic, and cultural problems, nor have these programs incorporated Amerindian worldviews and Latin American thinkers in a systematic way.<sup>34</sup> Instead, a Eurocentric vision of the world is presented as universally valid and applicable. This vision is being legitimized not only by academia, but also by the state, under the assumption of objectivity, science, and technology. Colombian philosopher Santiago Castro-Gómez has criticized the omnipresence of this approach, elaborating a detailed deconstructive argument that demonstrated that the supposed objectivity implies not only an epistemological control, but also “an economic and social control over the world that obeys the interests of the Spanish conquerors (and later the other hegemonic nations and institutions of the contemporary world system) to eradicate any other belief system that would

politics. . .” (p. 715). Then, he adds that “the main danger from an imposed politic come from forced or voluntary, censure coming not only from the media (radio, television, press), but from the close of mind the Chilean people was forced over him or herself trying, at least, to survive. Consequently, during many years they could not express themselves, not even in the family circle, afraid of denunciation” (p. 716).

<sup>33</sup> For the case of Brazil, see Nascimento, “Environmental Philosophy in Brazil?”

<sup>34</sup> See, for example, the prevalence of European authors and the history of the “universal philosophy” in the curricula of the undergraduate and graduate programs in philosophy in the Chilean universities, compiled on one of their web pages (<http://www.filosofiaenchile.org/dondeestudiar.htm>). Latin-American authors that have shaped philosophical proposals for regional contexts—starting with anthropological philosophy, Marxist critique, and the rediscovery of geocultural identity—have been left out or relegated to a marginal position in philosophy programs in the main Chilean universities (also Argentinean universities). Foundational works such as Félix Schwartzman, *El sentimiento de lo humano en América* (Santiago: Universidad de Chile, 1950) or Rodolfo Kusch, *América Profunda* (Buenos Aires: Editorial Biblos, 1963) and *Geocultura del Hombre Americano* (San Antonio de Padua, Argentina: Editorial Castañeda, 1976) are not included in these programs. It is necessary to point out, nevertheless, that these works and those of other Latin-American thinkers are studied with growing interest in interdisciplinary programs, such as post-colonial studies in the Latin-American Studies Program of the University of Chile (Postgrado de Estudios Latinoamericanos de la Universidad de Chile); the project about ethics, modernization and social control in the Bío-Bío Region in the Master Program in Western History of the University of Bío-Bío; or the field environmental philosophy program associated to the Master Program in Subantarctic Biocultural Conservation at the University of Magallanes, Chile.

not favor a capitalist vision of the *Homo oeconomicus*.<sup>35</sup> Although acute, this type of criticism has not been sufficient to generate a paradigm shift that reorients the teaching of philosophy, nor the making of development policies, which remain “blind” with regard to the unique eco-cultural attributes of the Latin American ecoregions. Instead, development policies emphasize scientific and technical work that privileges a few global economic parameters. The blindness to the regional biocultural diversity conveys ethical problems associated with the imposition of uniform educational programs that serve the purposes of economic mega-projects. Large scale mining, hydroelectric dams, and monocultures—such as eucalyptus or soybean plantations, shrimp pools or salmon-culture—install global models and infrastructures that deny the presence of, and oppress, both, the local human populations with their traditional habits and the other-than-human co-inhabitants that share the regional habitats in Chile and Latin America.<sup>36</sup>

### III. BIOCULTURAL ETHICS

In the former historical context, in the early 1990s after the return of democracy to Chile, the Ministry of Education launched the program “Enhancement of the Quality and Equity of Education.” As part of that general program, we developed a subprogram called the “Teaching of Ecology in the Everyday Environment,” in which students examined how biodiversity is represented in the grocery stores, newspaper kiosks, the flora of the plazas and gardens, school textbooks, and economic activities.<sup>37</sup> The results were overwhelmed by the prevalence of a few cosmopolitan domesticated plant and animal species in all these domains of Chilean culture. Moreover, exotic habitats, such as extensive lands covered by monocultures of the Californian Monterrey pine, were perceived as native forests by urban dwellers. These habitats fostered cultural habits associated with global market economy, and displaced traditional relationships with the native biota. Therefore, for effective conservation in Latin America it is essential to protect both the habits and the habitats of Amerindian and other ancient regional communities. Biocultural ethics demands that the systemic understanding about the biophysical, linguistic, economic, and political interrelationships embedded in the identity of the inhabitants, their habits, and their regional habitats be recovered. I say recover because although these links have been largely ignored by modern dominant ethics that are centered in human habits, ancestral Amerindian ecological worldviews, early Western philosophy, as well as contemporary ecological, evolutionary, behavioral, and health sciences, provide foundations that support the integration of the habits of the inhabitants and the habitats where these habits are practiced (Figure 3).

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<sup>35</sup> Santiago Castro-Gómez in *La Postcolonialidad Explicada a los Niños* (Popayán, Colombia: Universidad del Cauca-Instituto Pensar, 2005), p. 63 (English translation by Ricardo Rozzi). See also Santiago Castro-Gómez, *La Hybris del Punto Cero: Ciencia, Raza e Ilustración en la Nueva Granada (1750–1816)* (Bogotá, Colombia: Editorial Pontificia Universidad Javeriana, 2005).

<sup>36</sup> See Rozzi, “Ética ambiental,” pp. 311–59.

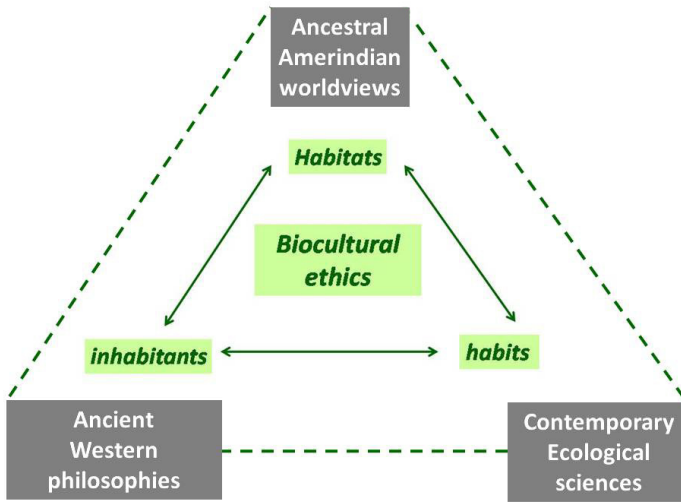


Fig. 3. Ecological-philosophical framework of biocultural ethics. Ancient Amerindian ecological worldviews and Western philosophies, as well as contemporary ecological sciences, acknowledge the dynamic, reciprocal interrelationships between the well-being and identity of the inhabitants, their habits, and the habitats they inhabit.

#### ETHOS: A WESTERN ROOT OF BIOCULTURAL ETHICS

The word *ethics* originated from the Greek term *ethos*, which in its more archaic form meant a *den*: the dwelling of an animal.<sup>38</sup> The first recorded use of the term *ethos* is found about 1000 B.C., in the *Iliad* and the *Odyssey*. As Mexican philosopher Juliana González has remarked, Homer employed the term *ethos* in the plural form *ethea* to refer to the “accustomed haunts of animals.”<sup>39</sup> Later, in the eighth century B.C., Hesiod used *ethea* to refer to the “accustomed abodes of men” in his *Works and Days*.<sup>40</sup> The use of *ethea* to refer to “abode” or “dwelling place” continued with Pindar, the lyric poet contemporary of Heraclitus, in his *Pythians*, two centuries after Hesiod.<sup>41</sup>

Yet, as Canadian Religious scholar Shirley Darcus has noted, in Hesiod’s work

<sup>37</sup> Ricardo Rozzi, Peter Feinsinger, and Roxana Riveros, *Enseñanza de la Ecología en el Entorno Cotidiano* (Santiago, Chile: Ministerio de Educación de Chile, 1997).

<sup>38</sup> See H. G. Liddell and R. Scott, *A Greek-English Lexicon*, 9th ed. (New York: Oxford Press, 1996). See also Juliana Gonzalez, *El Ethos: Destino del Hombre* (Mexico City: Fondo de Cultura Económica, 1996), pp. 9–12.

<sup>39</sup> Juliana Gonzalez, *El Ethos*. See also Todd Frobish, “An Origin of a Theory: A Comparison of Ethos in the Homeric *Iliad* with that Found in Aristotle’s *Rethoric*,” *Rhetoric Review* 22 (2003): 16–30.

<sup>40</sup> For a concise historical account of the meaning of the term *ethos* in the pre-Aristotelian period, see Shirley Darcus, “Daimon as a Force in Shaping Ethos in Heraclitus,” *Phoenix* 28 (1974): 390–407.

<sup>41</sup> *Ibid.*

ethos also acquired a second meaning. In his *Works and Days* and *Theogony*, in addition to refer to the “accustomed abodes of men,” Hesiod used *ethea* to refer to “customary habits of men or gods.”<sup>42</sup> In her review of the term *ethos*, Shirley Darcus found that the meaning of *ethos* as a *habit* emerged in the work of several of the Greek lyric poets. For example, Solon employed *ethos* to refer to the “ways in which humans are accustomed to act,” and Simonides used *ethos* to mean “a way of behavior suitable to a young baby.”<sup>43</sup> In the sixth century B.C., Theognis expanded the scope of this second meaning of *ethos* by making the distinction between two essential elements that influence it: the practiced *habits* and the innate *dispositions*. In the fifth century B.C., Pindar continued using *ethos* in the sense of disposition, referring to humans and to other animals. In the *Olympians*, he wrote that “neither the fox nor the lion can change its *ethos*,” and regarding humans, he affirmed that “it is difficult to conceal one’s *ethos*.”<sup>44</sup>

From these records preserved in the oldest texts of the early Greek poets we learn three important facts:

- (1) In the earliest records of the term *ethos*, it meant a dwelling place.
- (2) The primeval meaning of *ethos* also implied an accustomed habit.
- (3) Both early meanings of *ethos* implied a unified view of humans and other-than-human animals.

This original meaning of *ethos*, which integrated the habitats and habits, began to be lost in the late work of Pindar. According to Darcus, Pindar gave increasing attention to the innate dispositions and the role of the gods in molding the *ethos* of a person.<sup>45</sup> Darcus points out that in the *Nemeans*, Pindar prays to be saved by Zeus from having a deceitful *ethos* and to walk instead in the simple paths of life. Later in the fourth century, the term *ethos* was used by Aristotle at the beginning of book two of *The Nichomachean Ethics* to affirm that “moral virtue comes about as a result of habit, whence also its name (*ethike*) is one that is formed by a slight variation from the word *ethos* (habit).”<sup>46</sup> In this work Aristotle focuses on human “habits,” and does not develop an analysis of native habitats, and their interrelationships with human habits.<sup>47</sup> And he explicitly excludes consideration of the *ethea* of nonhuman animals.

In this drift of the meaning of *ethos*, it is noteworthy how its meaning as habitat fades out, perhaps reflecting the fact that Aristotle was an urbane and cosmopolitan

<sup>42</sup> Ibid., p. 391.

<sup>43</sup> See Simonides’ Danae fragment (543.8–9 PMG) and Solon’s passage (24.13–14D = 36 West), both quoted in Darcus, “Daimon as a Force in Shaping *Ethos* in Heraclitus,” p. 391.

<sup>44</sup> Darcus, “Daimon as a Force in Shaping *Ethos* in Heraclitus,” p. 393.

<sup>45</sup> Ibid.

<sup>46</sup> See the analysis of Aristotle’s *Nichomachean Ethics* by Arthur Miller in “Aristotle on Habit and Character: Implications for the Rethoric,” *Speech Monographs* 41 (1974): 309–16.

<sup>47</sup> See Michael Halloran, “Aristotle’s Concept of *Ethos*, or if not his Somebody Else’s,” *Rhetoric Review* 1 (1982): 58–63, who highlights Aristotle’s focus on the *polis* as the milieu where habits are cultivated.

thinker centered in the *polis*. As a consequence of this omission the two primeval meanings of *ethos*, *habitat*, and *habit*, were disconnected in Aristotelian and later in modern ethics. Biocultural ethics seeks to reconnect these two definitions through the common element found in both of the early Greek definitions of *ethos*: “accustomed place” and “accustomed habit.”

Under an ecological-evolutionary perspective these definitions of *ethos* can be interpreted in the following terms: in the long-term, inhabiting a particular habitat generates recurrent forms of inhabiting, i.e., habits configure the *ethos* or character of humans and non-human animals alike. The habitat becomes an integral element, even the condition of possibility, for the cultivation of a given habit. In turn, the performance of the cultivated habits modifies the habitat where they take place.<sup>48</sup> This ecological hermeneutics links the etymological drift of the concept of *ethos*, moving in between its meanings of *vital physical space* (the habitat) and of *vital movement* (to inhabit). Both meanings become interwoven in the emergence of recurrent forms of inhabiting (habits) in the habitat. The practice of these habits forms the moral character, and shapes both the biological and cultural characteristics of the inhabitant.

The ecological-evolutionary perspective of biocultural ethics also understands that the cultivation of moral character occur through habits that imply co-evolutionary interrelationships of co-inhabitation. The co-inhabitants are mutually modified in these recurrent interactions that configure their habits. In the interactions with other living beings the forms of inhabiting evolve into forms of co-inhabiting, which establish communities of co-inhabitants. These biotic and cultural communities influence their habitats, and are influenced by them. The human beings and their *ethos* emerge co-inhabiting with the diverse human and other-than-human beings. Under this biocultural perspective, the cultivation of the moral character as much as the cultivation of the land arises, embedded in the web of co-inhabitation: interweaving the *biosphere*, the *technosphere*, and the *logosphere*.

The holistic integration of habitats and habits, ecosystems and cultures, involving physical, biotic, and symbolic bodies is also manifest in ancestral Amerindian ecological knowledge and contemporary ecological scientific knowledge.

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<sup>48</sup> As much as in the early meanings of *ethos*, this modern ecological-evolutionary translation of the Greek concept applies to both animals and humans. For example, a woodpecker can only perform its habit of pecking wood where there are trees to peck. The trees will have holes that will provide nesting and roosting habitat to the woodpecker and other bird species only if the woodpecker performs its pecking habit. Hence, a series of reciprocal links are established between the habits, the habitats, and the community of co-inhabitants. Moreover, the identity or “character” of the woodpecker emerges through the habit of pecking performed in a woody habitat. As much as under an Aristotelian ethics, the lyre players need a lyre to cultivate their habit, under an ecological perspective, the woodpeckers need the woods to cultivate their habits. The reciprocal links between habits or behavior and the habitats where they take place have been recently emphasized in ecological sciences by the concepts of “extended phenotype” and “niche construction,” which have also been integrated in theories of human biological and cultural evolution. For a concise account, see Kevin N. Laland, John Odling-Smee, and Marcus W. Feldman, “Niche Construction, Biological Evolution, and Cultural Change,” *Behavioral and Brain Sciences* 23 (2000): 131–75.

AMERINDIAN BIOCULTURAL ETHICS: THE CASE OF THE PEWENCHE HABITS AND HABITATS

As numerous Amerindian cultures, the largest indigenous group of southern South America, the *Mapuche* people, define themselves as the people (= *che*) of the land (= *mapu*). Their close links to the land are compellingly expressed in their language (= *dungu*), *Mapu-dungun* that onomatopoeically dialogues with the *mapu*, and the specificity of the names of the main Mapuche groups which refer to both the habits and the habitats they inhabit. For example, the *Pewenche* are the people of the *Pewen* or Monkey-Puzzle tree (*Araucaria araucana*) forests of the volcanic Andean mountain range in southern Chile and Argentina (37–40°S), and an essential habit is the gathering of the monkey-puzzle tree cones, whose seeds provide the nutritive foundation of their diet.<sup>49</sup>

The *Pewenche* traditional ecological knowledge and lifestyle are still alive, and the social organization and distribution of the clans are closely associated with the particular distribution of patches of *Pewen* trees.<sup>50</sup> However, today both the *Pewenche* habits and habitats are threatened by development policies. For example, the *Pewenche* people have been opposing the construction of dams in their territories since the 1980s. In 1994 the construction of a dam on the Bio-Bio River would flood their ancestral habitats, and the government proposed a relocation of the communities. The *Pewenche* reacted with arguments that concurred with a biocultural ethics perspective because they demanded to consider the interrelationships between their specific habits and habitats in order to achieve the well-being of human and their other-than-human co-inhabitants. In order to facilitate the translation of the *Pewenche* demands into policies, we initiated scientific, ecological, and medical research into the relationships among the distribution of *Pewen* trees, the dietary value of the *Pewen* seeds, and the health of the *Pewenche*. We promptly found that among the fruits and seeds available in the *Pewenche* territory, the seeds contained in the cones of the *Pewen* trees had the highest levels of methionine (0.130g/100 g) and cysteine (0.110g/100g).<sup>51</sup> These are the only two amino acids that contain sulfur in their molecular structure, and methionine is an *essential amino acid*; i.e., the human body is unable to synthesize it, and a lack of it can cause a protein deficiency. Therefore, this amino acid must be obtained through an external nutritive

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<sup>49</sup> Nowadays the *Pewenche* collect these large cones using ropes, which they throw like lassos in order to bring the cones down from the top of the trees. *Pewenche* people eat the seeds or *ngülliw* raw, toasted, heated in the ash of the fire, and boiled. See Alberto Tacón, "Recolección de piñón y conservación de la *Araucaria* (*Araucaria araucana*, Mol. Koch.): Un estudio de caso en la comunidad de Quinquén" (Master's thesis, Universidad Austral de Chile, Valdivia, Chile, 1999). See also Ricardo Rozzi and Francisca Massardo, "The Road to Biocultural Ethics," *Frontiers in Ecology* 9 (2011): 246–47.

<sup>50</sup> See David Aagesen, "Indigenous Resource Rights and Conservation of the Monkey-Puzzle Tree (*Araucaria araucana*, *Araucariaceae*): A Case Study from Southern Chile," *Economic Botany* 52 (1998): 146–60.

<sup>51</sup> Cf. Ricardo Rozzi and Francisca Massardo, "Similitudes y diferencias interculturales en las éticas ambientales," in Primack et al., *Fundamentos de Conservación Biológica*, pp. 319–321.



source, such as the *pewen* seeds. This analysis from the medical science perspective provided a functional explanation to the *Pewenche* demands. Our medical-sciences analyses also allowed us scientifically to understand the profound meaning of what is implied by the Amerindian name and concept of “being” the people of the *Pewen*. By eating its seeds, the *Pewenche* incorporate cysteine and methionine, which become proteins in their bodies. Thus, the *Pewenche* biophysical bodies, as well as their cultural identities are nurtured by these trophic, socio-ecological relationships, which can be understood from both the *Pewenche* and the scientific worldviews.

Environmental geographer Thora Martina Herrmann has found that

. . . the Araucaria forest is perceived by the *Mapuche Pewenche* to form lineages *lof-pewen*, akin to human lineages *lof-che*, so stands of Araucaria are seen as an extended family analogous to the *Pewenche* extended families, or *lof*. The male tree, *wentru-pewen*, and the female tree, *domo-pewen*, are thought to marry each other, linking their roots.”<sup>52</sup>

The *Pewen* tree is considered sacred, as being created by the land to feed his sons; thus the tree makes possible the life of the *Pewenche*. A scientific biogeochemical analysis of the sulphur cycle provides additional insights about the *Pewenche* worldview. The entrance of sulfur into the bio-geochemical cycle comes from the volcanoes and their ash, which is transported by wind and water. Rivers bring the volcanic sulfur to the soils. On the soils, bacteria and fungi transform, through processes of oxidation and reduction, molecules of hydrogen sulfide ( $H_2S$ ) and sulfur dioxide ( $SO_2$ ) emitted by volcanoes into molecules of sulfate ( $SO_4$ ). In this chemical form the sulphur is absorbed by the roots of the *pewen*. Once inside the tree, a chain of metabolic reactions begins in the vegetable cells, where enzymes assimilate sulfur from the inorganic molecules of sulfate, incorporating them in a process of synthesis of organic molecules that generate the two essential amino acids that contain sulfur: methionine and cysteine. Therefore, when the *Pewenche* eat the fruit of the *Pewen*, they are also eating sulfur from the volcanic rocks and ashes. Hence, the *Pewenche* are “people of the *Pewen*,” and at the same time they are *Mapuche*, “people of the land” (including the volcanoes). Symbolic-linguistic and physical-biotic bodies are interwoven in this profound integration of habitats, habits, and co-inhabitants.

Bringing together Amerindian knowledge and management practices with western medical and ecological sciences was essential not only to mutually confirm and reinforce each of these forms of knowledge, but to achieve policies that could integrate the positions and interests of contrasting, and frequently conflicting, stakeholders. The location of the projected dam on the Bio-Bio River was modified after these considerations were included in the Environmental Impact Assessment

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<sup>52</sup>Thora Martina Herrmann, “Indigenous Knowledge and Management of Araucaria Araucana Forest in the Chilean Andes: Implications for Native Forest Conservation,” *Biodiversity and Conservation* 15 (2006): 654–55.

of the project. However, the *Mapuche Pewenche* property rights to their ancestral lands are still in continuous peril, and their ecological knowledge and values are still largely ignored in conservation, educational, and development policies by the Chilean government.<sup>53</sup> Today, a biocultural ethics stresses the need to allow the expression of local forms of ecological knowledge, and to translate them into national and international policies. The ecological worldview and practices of the *Mapuche* people offer a clear example of symbolic and bio-physical integration of the well-being of human and other-than-human co-inhabitants. Their case brought together representatives from Amerindian, scientific, public health, tourism, and other stakeholders. Rather than focusing on the invention of a new ecological worldview, biocultural ethics focuses on the expression of the plethora of existing ecological worldviews, values, and sustainable practices. Appropriate philosophical translation and political mediation can contribute to them being respected in national and international policies and to a better understanding of their connection to specific habitats and habits. Many traditions are alive within and beyond Western civilization, which can contribute to the health and sustainability of local communities, as well as global society and the biosphere.

CONTEMPORARY ENVIRONMENTAL JUSTICE AND BIOCULTURAL ETHICS:  
THE CASE OF ECUADORIAN MANGROVES AND *CONCHERAS*

A variety of global development projects overlook social and ecological problems derived from the disruption of local habitats and habits that communities have developed in them. A notorious example from Ecuador serves to illustrate this point: the Ecuadorian shrimps, famous in today's international cuisine. Commercial cultivation of two species of shrimps (*Penaeus stylirostris* and *P. vannamei*) began in Ecuador in 1968. Fifteen years later, this South American country became the world's principal producer of shrimps in 1983.<sup>54</sup> This boom involved such a large environmental impact that today the extension of shrimp pools surpasses that of mangroves along the Ecuadorian coast.

Local communities have resisted the invasion of the shrimp industry, and have opposed this type of development since the 1970s. *Concheras*, or women who collect "conchas" or shellfish for selling and for subsistence in the mangroves of the Ecuadorian and Central American coastal communities, have attempted to stop deforestation of mangroves, risking their lives by lying down in front of bulldozers and excavating equipment that creates the shrimp pools.<sup>55</sup> The majority of these women and their communities are African descendents, and conscious about how the explosive growth of shrimp exports is complemented by a contrasting misery

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<sup>53</sup> Ibid.

<sup>54</sup> Luis Suárez and Doris Ortiz, "Producción de camarones y destrucción de manglares en Ecuador," in Primack et al., *Fundamentos de Conservación Biológica*, pp. 195–97.

<sup>55</sup> Ibid.

for the coastal inhabitants of Ecuador. On 11 March 1999, a *conchera* wrote a strong environmental justice demand:

We have always been ready to cope with everything, and now more than ever, but they want to humiliate us because we are black, because we are poor, but one does not choose the race into which one is born, nor does one choose not to have anything to eat, nor to be ill. But I am proud of my race and of being *conchera* because it is my race which gives me strength to do battle in defense of what my parents were, and my children will inherit; proud of being *conchera* because I have never stolen anything from anyone, I have never taken anybody's bread from his mouth to fill mine, because I have never crawled on my knees asking anybody for money, and I have always lived standing up. Now we are struggling for something which is ours, our ecosystem, but not because we are professional ecologists but because we must remain alive, because if the mangroves disappear, a whole people disappears, we all disappear, we shall no longer be part of the history of Muisne, we shall ourselves exist no longer. . . . I do not know what will happen to us if the mangroves disappear, we shall eat garbage on the outskirts of the city of Esmeraldas or in Guayaquil, we shall become prostitutes, I do not know what will happen to us if the mangroves disappear. . . . what I know is that I shall die for my mangroves, even if everything falls down my mangroves will remain, and my children will also stay with me.<sup>56</sup>

The testimony of the *conchera* expresses a deep understanding about the vital bonds of her community, their habits and well-being, to the coastal habitats. Biocultural ethics highlights the need to better incorporate the specificities of local habits linked to local habitats, both of which are overridden by prevailing global free-market economic policies. The *conchera's* criticism makes it obvious that large-scale natural resource exploitation models generally satisfy the needs of consumerist societies in distant places, and not of local people. More than ninety percent of the shrimp produced and exported by companies based in Ecuador are consumed only by people of three regions: U.S. (fifty-one percent), Japan (twenty-seven percent), and the European Union (seventeen percent).<sup>57</sup> In addition, in Latin America habitat degradation is frequently caused by a few companies, and not by "the poor" as is frequently claimed. Short-term economic projects recurrently generate rapid socio-ecological degradation. It is important to note that coastal areas are public lands and mangroves are protected by several Ecuadorian laws, as well as by international treaties. However, these regulations and the rights of local communities are ignored to favor shrimp industries.

Ecological sciences also provide key insights to better understand the relationships between the integrity of the mangrove habitats and the well-being of coastal communities. Mangroves are key habitats for a high diversity of biological species in tropical regions of the world. Moreover, mangroves provide essential ecosystem

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<sup>56</sup> Joan Martínez-Alier, "Ecological Conflicts and Valuation: Mangroves versus Shrimps in the Late 1990s," *Environment and Planning C* 19 (2001): 715–16.

<sup>57</sup> Cf. Suárez and Ortiz, "Producción de camarones y destrucción de manglares en Ecuador," n. 24.

services by acting as “ecosystem membranes” between terrestrial and marine ecosystems, recycling nutrients and regulating hydrological flows. Their massive conversion to shrimp pools dramatically increases the levels of sedimentation in coastal waters, and the loss of nutrients that are limiting in tropical soils. Shrimp industries also discharge contaminated waters and divert the course of streams and rivers. These industries cause serious social problems by limiting the access of local communities to coastal natural resources and increasing income differences between a few rich people and a growing number of poor people. The conversion of mangroves and the pollution of estuarine ecosystems drastically affect the diversity and population levels of species of algae, fish, crustaceans, and mollusks that depend on mangroves at some phase of their life cycles,<sup>58</sup> and the health of humans who traditionally gather and consume shrimps, crabs, oysters, and other organisms in these coastal habitats.<sup>59</sup> This all proves the point that the export boom of Ecuadorian shrimps has a less known “side effect”: it not only has provoked drastic habitat degradation, but it also has brought a reduction in the quality of life of local people inhabiting the coastal region of that country.

As a result of the local opposition, in alliance with academic, conservationist, media, and national and international political partners, the government established a biological reserve of mangrove ecosystems in Provincia Esmeraldas in 1995. Moreover, in 1999 a presidential decree forbade the cutting of mangroves in Ecuador. From a biocultural ethics perspective, this case provides some hope for a better integration between environmental and social policies.

#### IV. BIOCULTURAL CONSERVATION

Since the 1960s, Latin American liberation philosophy and liberation pedagogy have emphasized the need to allow the expression of the pluriversal epistemologies and local histories of communities that exist at the borders of globalization.<sup>60</sup> Liberation philosophy, theology, and pedagogy have criticized epistemological, economic, and political colonialism, and have focused on the severe oppression suffered by the growing number of poor human communities, who today live mostly in the slums of cities.<sup>61</sup> Biocultural ethics emphasizes that to achieve equity and sustainability we have to go one step further, and overcome the colonial anthropocentrism by regaining a perspective of co-inhabitation that integrates the well-being of both human and other-than-human beings. As argued above, this integration finds strong

<sup>58</sup> Cf. Verónica Mera, *Género, Manglar y Subsistencia* (Quito, Ecuador: Ediciones Abya-yala, 1999).

<sup>59</sup> Cf. Mike Hagler, “Shrimp—The Devastating Delicacy,” *Greenpeace Reports*, May 1997 (<http://archive.greenpeace.org/oceans/shrimpaquaculture/shrimpreport.html>).

<sup>60</sup> See Ricardo Rozzi, “Filosofía Ambiental Latinoamericana,” in Enrique Dussel, Eduardo Mendieta, and Carmen Bohórquez, eds., *El Pensamiento Filosófico Latinoamericano, del Caribe y ‘Latino’ (1300–2000): Historia, Corrientes, Temas y Filósofos* (México, D.F.: Siglo XXI, 2010) pp. 434–45.

<sup>61</sup> Cf. Paulo Freire, *Pedagogy of the Oppressed* (New York: Continuum, 1970); Enrique Dussel, *Liberation Philosophy* (New York: Orbis Books, 1980); Leonardo Boff and Jum Cumming, *Ecology and Liberation* (New York: Orbis Books, 1995).

support in at least three families of worldviews: contemporary ecological sciences, ancestral Amerindian ecological knowledge, and early Western philosophies as expressed in the analysis of the archaic meaning of *ethos*.

Biocultural ethics highlights the fact that many communities exhibit sustainable and respectful forms of co-inhabitation.<sup>62</sup> Instead of referring to a general problem between the global society or humanity and the environment, it proposes to identify specific drivers, and to sanction specific agents. This “fine-filter approach” of biocultural ethics complements the call for an *Earth Stewardship* proposed by the Ecological Society of America in 2011.<sup>63</sup> It calls attention to the incorporation of the diverse mosaic of habitats, habits, and co-inhabitants within the currently prevailing homogenous global education, administrative, and economic systems. This incorporation would favor not only the continuity of regional sustainable cultures and their habitats, but also would provide ethical foundations for a planetary heterogeneous, meta-culture of sustainable, global co-inhabitation.

To enhance understanding about the essential value that biocultural diversity has for sustainability and to counterbalance the alienation of prevailing homogenizing development models, policy making, and educational programs from the regional habitats (their inhabitants and habits), at the southern end of the Americas, we have developed a methodological approach that provides a guide for students theoretically and experientially to understand biocultural ethics: “field environmental philosophy”(FEP).<sup>64</sup>

We call it *field* for three reasons: (a) in the field researchers and students can perceive and research components and processes of biocultural diversity that are, inadvertently or deliberately, omitted in formal education. (b) By integrating their senses and emotions with their rationality, students achieve an integral *in situ* perception of biocultural diversity through the interactions with co-inhabitants in their regional habitats. (c) Most importantly, in the field, biocultural diversity ceases to be a mere concept or object of study, and begins to be an experience and awareness of co-inhabitation with diverse living beings and life histories, which regularly remain outside the experiential domain of formal education. We add the adjective *environmental* in order to overcome the prevailing modern reduction of ethics to purely human affairs, by making explicit the ancient meaning of *ethos* and the socio-ecological dimension of ethics disclosed by contemporary sciences.

It is *philosophy* (instead of natural history or field ecology) for two reasons: (1) field environmental philosophy comprises an epistemological dimension—students

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<sup>62</sup> Cf. J. Baird Callicott, *Earth's Insights: A Survey of Ecological Ethics from the Mediterranean Basin to the Australian Outback* (Berkeley: University of California Press, 1997).

<sup>63</sup> Stuart Chapin, Mary Power, Steward T. A. Pickett et al., “Earth Stewardship: A Framework to Transform the Trajectory of Society’s Relationship to the Biosphere,” *Social, Behavioral, and Economic (SBE) Sciences White Paper*, no. 9, Ecological Society of America, 2010 ([http://www.esa.org/earthstewardship/files/SBEWhitePaper9\\_29%20ESA.pdf](http://www.esa.org/earthstewardship/files/SBEWhitePaper9_29%20ESA.pdf)).

<sup>64</sup> See Ricardo Rozzi and collaborators, “Field Environmental Philosophy and Biocultural Conservation at the Omora Ethnobotanical Park: Methodological Approaches to Broaden the Ways of Integrating the Social Component (“S”) in Long-Term Socio-Ecological Research (LTSER) Sites,” *Revista Chilena de Historia Natural* 83 (2010): 27–68.

and researchers not only investigate biological and cultural diversity, they also investigate how this diversity is researched, and apprehended by different sciences, the arts, the humanities, economics, and traditional forms of ecological knowledge, including the diversity of values and perceptions held by different institutions and socio-cultural groups who speak different languages and hold distinct forms of ecological knowledge and practices; (2) field environmental philosophy comprises an ethical dimension—its aim is that students, researchers, decision makers, and other participants not only conduct research and learn about biological and cultural diversity, but, foremost, they learn to respectfully and sustainably co-inhabit within biocultural diversity.<sup>65</sup>

In the context of current global environmental change, to effectively implement field environmental philosophy we faced the challenges of establishing a long-term transdisciplinary program that could work at multiple geographic, ecological, and political scales. Toward this end, in collaboration with the Regional Government of the Chilean Magellanic and Antarctic Region, the regional public university (Universidad de Magallanes), and a non-governmental organization (Omora Foundation), in 1999 we created the Omora Ethnobotanical Park in Puerto Williams, in Cape Horn. In order to integrate programs at multiples scales, we established a nested organization model. At the *local scale*, Omora Park functions as a biocultural research, education, and conservation center for the UNESCO Cape Horn Biosphere Reserve. At the *national scale*, Omora Park forms part of a Chilean Long-Term Socio-Ecological Research network coordinated by the Institute of Ecology and Biodiversity (IEB), and represents its southernmost site. At the *international scale*, Omora Park serves as a natural reserve and a field station for the Sub-Antarctic Biocultural Conservation Program, coordinated by the Universidad de Magallanes, IEB, and the University of North Texas (UNT).<sup>66</sup>

With this multiple-scale approach, and using field environmental philosophy methodology in 2003 we created the first graduate program in southern Patagonia, a Master of Science degree in Biocultural sub-Antarctic Conservation at the University of Magallanes (UMAG), which uses the Omora Park as a field site to conduct long-term biocultural research, education, and conservation projects. In 2005, after a five-year inter-institutional process we succeeded in the creation of the UNESCO Cape Horn Biosphere Reserve, which encompasses an area of five million hectares of marine and terrestrial ecosystems at the southern end of the Americas. In 2006, we coupled courses and research projects associated with the master's degree program at UMAG, with the graduate programs in philosophy

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<sup>65</sup> The field environmental philosophy methodology is described in greater detail in Ricardo Rozzi, Juan Armesto, Julio Gutiérrez, Francisca Massardo, Gene Likens, Christopher Anderson, Alexandria Poole, Kelli Moses, Eugene Hargrove, Andrés Mansilla, James Kennedy, Mary Wilson, Kurt Jax, Clive Jones, J. Baird Callicott, and Mary Kalin, "Integrating Ecology and Environmental Ethics: Earth Stewardship in the Southern End of the Americas," *BioScience* 62 (2012): 226–36.

<sup>66</sup> The multiple scale approach of the Omora Ethnobotanical Park and the Sub-Antarctic Biocultural Conservation Program is described in detail in Rozzi and collaborators, "Field Environmental Philosophy and Biocultural Conservation."

and in biology at the University of North Texas (UNT) in the U.S., and with the Institute of Ecology and Biodiversity in Chile to create a solid academic platform. In 2010, we inaugurated the Field Environmental Philosophy and Biocultural Conservation Field Station in Puerto Williams, capital city of the Antarctic Province of Chile, which has consolidated the *in situ* establishment of an international, inter-institutional network of long-term socio-ecological research that incorporates the interface between ecological sciences and environmental philosophy as one of its major areas. In 2011, in collaboration with the regional government and the private sector we formally started the “Ecotourism with a Hand-Lens” program. This new type of tourism enhanced appreciation of ecological interactions and the beauty of the austral bryoflora, while at the same time providing a sustainable source of income for local communities in the Cape Horn Biosphere Reserve. Today, authorities, teachers, tourist operators, and the local community of Cape Horn appreciate not only roses and apples but also the ecological and ethical values of the diverse subantarctic flora. The Chilean Government supports this innovative idea by funding training courses and publications on the natural history of mosses, liverworts, and lichens.<sup>67</sup>

As in the case of the defense of mangroves in Ecuador, the former achievements show that a biocultural ecological and ethical understanding can be incorporated into policy changes that support biocultural education and conservation programs. To achieve these changes, it was essential to include field experiences in which participants had an opportunity to share the biological and cultural singularities of the remote Cape Horn archipelago with members of the Yahgan indigenous community, as well as with authorities, students, philosophers, artists, ecologists and other researchers. Field environmental philosophy offers a methodological approach to integrate ecological sciences and environmental ethics through interdisciplinary work that fosters the consideration of interrelated habitats, cultures, and biological species into an ecologically and culturally contextualized ethics. The field environmental philosophy has established a four-step cycle methodology, which not only helps students to gain understanding about scientific and traditional ecological knowledge, but also facilitates an *in situ* ethical practice.<sup>68</sup>

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<sup>67</sup> Rozzi et al., “Changing Lenses to Assess Biodiversity”; Bernard Goffinet, Ricardo Rozzi, Lily Lewis, William Buck, and Francisca Massardo, *The Miniature Forests of Cape Horn: Eco-Tourism with a Hand-lens* (“Los Bosques en Miniatura del Cabo de Hornos: Ecoturismo con Lupa”), bilingual English-Spanish ed. (Denton, Tex.: UNT Press and Punta Arenas, Chile: Ediciones Universidad de Magallanes, 2012).

<sup>68</sup> Field environmental philosophy has been incorporated as a methodology in graduate programs, which requires students and other participants to work through an interrelated a four-step cycle of (i) interdisciplinary ecological, ethno-ecological and philosophical research; (ii) composition of metaphors and communication through narratives; (iii) field activities guided with an ecological and ethical orientation, having the experience of direct or “face-to-face” encounters with human and other-than-human beings in their habitats; and (iv) implementation of areas for *in situ* biocultural conservation, to protect native habitats, to enable visitors to observe and enjoy these habitats, and to foster in the participants a sense of responsibility as ecologically and ethically educated citizens. See a more detailed description of the cycle in Rozzi et al., “Integrating Ecology and Environmental Ethics.”

History is not linear. Multiple biocultural histories simultaneously take place in different regions of the biosphere. To discover them requires field experiences of co-inhabitation. *In situ* experiences contribute to diversify the biotic and cultural picture, pluralizing environmental philosophy and ecological sciences. This favors hybridization of knowledges of different disciplines, different cultures, grounded in different ecosystems. Specific biotic and socio-cultural contexts hold specific forms of ecological knowledge and relationships with nature, which are habitually ignored by dominant global discourses. In the final part of this essay, I emphasize an integration of environmental philosophy and ecological sciences that goes beyond a case-study approach. The human and other-than-human inhabitants of the diverse regions are not merely objects of study, but are partners in the search for a sustainable biosphere. Biocultural ethics does not aim to merely develop a theoretical framework that re-couples the habits of the inhabitants with the habitats they inhabit. Most importantly, it proposes a partnership praxis of biocultural conservation. It extends the descriptive concept of biocultural diversity into the normative domain of an ethics that demands the recovery of forgotten or negated biophysical and biocultural realities, which today can contribute to both the regional and global sustainability of life.

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