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Ricardo Rozzi

FIELD ENVIRONMENTAL PHILOSOPHY: REGAINING AN UNDERSTANDING OF THE VITAL LINKS BETWEEN THE INHABITANTS, THEIR HABITS AND THE REGIONAL HABITATS

ABSTRACT

During our current free market era, a prevailing utilitarian ethics centered on monetary cost benefit analyses continues overriding incessantly a plethora of diverse forms of ecological knowledge and ethics present in the communities of South America, and other regions of the world. For the first time in human history, more than 50% of the world's population lives in cities, and speaks only one of eleven dominant languages, loosing contact with the vast biodiversity and the 7,000 languages that are still spoken around the planet. This global urban enclosure and biocultural homogenization generates physical barriers and conceptual barriers that hinder the understanding of the inextricable links between the habitats of a region, the inhabitants and their habits. However, these vital links are acutely recognized in at least three families of worldviews: contemporary ecological sciences, ancestral Amerindian ecological knowledge, and Western pre-Socratic philosophical roots expressed in the archaic meaning of ethos, and ethics. South American post-Columbian history shows that large-scale exploitation, as well as monocultures that replace native habitats, have been repeatedly associated with ephemeral economic booms that left behind degraded social and ecological environments. A historical analysis of post-Columbian Chile illustrates how a unique mosaic of ecosystems and biological species, cultures, and languages have been progressively replaced by a few biological species and a uniform language and culture. These biocultural homogenization processes are the outcome of a violent conquest, overpowering the resistance of local inhabitants, and today's scale of violent suppression of biological and cultural diversity is greater than ever. Instead of a post-colonial period we are living in the middle of an *ultra-colonial* era. To counterbalance these trends, at the southern end of the Americas, through inter-institutional and international collaborations led by the Chilean University of Magallanes and the Institute of Ecology and Biodiversity and the University of North Texas in the US, we developed a methodological approach that we call "field environmental philosophy.

Keywords: biocultural diversity; biocultural homogenization; colonialism; conservation; environmental ethics; sustainability.

To counteract the current massive losses of biological and cultural diversity driven by the prevailing global free-market society, it is critical to regain an understanding of the inextricable links between the habitats of a region, the inhabitants and their habits. These links are largely ignored by modern dominant ethics, which are centered in human habits. However, the evolution of human habits depends not only on the human subjects that cultivate them, but also on the habitats and the communities of other-than-human co-inhabitants with which they co-evolve.

Languages represent an essential cultural component of the habits. Each language expresses and also shapes the human habits, including the relations with other-than-human co-inhabitants. In consequence, to better understand the diversity of habits we need to examine the interrelationships between the *biosphere* and the *logosphere*. These interrelations between the material and the symbolic domains of culture generate a biocultural approach. Under this biocultural approach, the linguistic and cultural phenomena cannot be fully understood independently from their biological and ecological foundations, and vice versa the biological and ecological phenomena cannot be fully understood without a linguistic and cultural foundation.

In this article, I examine the integration of the spheres of the physical and biological life and the languages and worldviews maintained by Amerindian and rural communities in South America. I first concisely identify two types of barriers that today hinder the understanding of the biocultural interface for most citizens of the global urban society. Then I provide four cases of primeval integration of the regional habitats, the inhabitants and their habits, and contrast them with the current disruption of this integration caused by development models that impose foreign, homogenous habits. Finally, as a methodological approach to regain an understanding of the vital links between the human inhabitants and habits and their habitats and communities of co-inhabitants, I introduce the Field Environmental Philosophy (FEP) program developed in southern South America. This program involves an interdisciplinary and international collaboration between the Chilean programs on ecology and conservation led by University of Magallanes and the Institute of Ecology and Biodiversity, and the environmental philosophy program of the University of North Texas in the US.

I. PHYSICAL AND CONCEPTUAL BARRIERS

Contemporary global society is characterized by a rapid growth of urban population, and a drastic reduction of the diversity of human languages, forms

of ecological knowledge, values, and habitat types inhabited by most humans. This urban enclosure and biocultural homogenization of contemporary society generates both physical and conceptual barriers that hinder the awareness of and the understanding about biocultural diversity.

I.1 Physical barriers

At the beginning of the 21st century, for the first time in the history of the human species, more than 50% of the world's human population lives in cities.[1] The intensive rural to urban migration is a very recent and explosive phenomenon. Until mid 20th century more than 70% of the world population lived in rural areas, but since the 1950s an intensive and continuous process of rural–urban migration has taken place, and in 2007 urban population surpassed the rural one (Figure 1). Suddenly the native habitats have been left without their ancestral human custodians. This has accelerated processes of land use changes, including habitat degradation and loss. At the same time, this rural to urban migration has had detrimental consequences for the quality of life of massive numbers of the regional inhabitants.

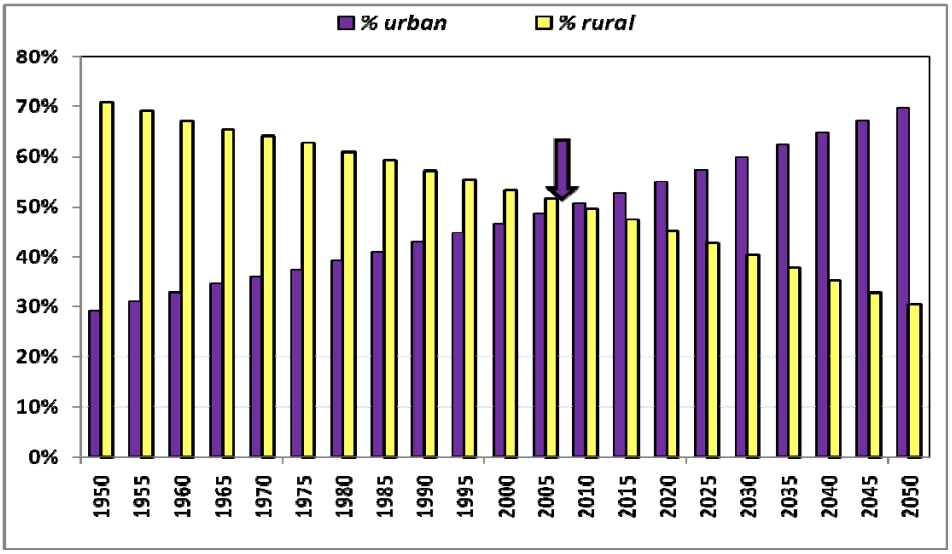

Figure 1. Relative percentages of rural and urban world population since 1950, including estimated percentages until 2050.[2]

[1] Christopher Flavin (2007), Preface. In Starke L (ed.) "State of the World 2007: Our Urban Future", pp. xxiii-xxv. Worldwatch Institute, Wahington DC. pp. 250.

[2] Source World Urbanization Prospects: The 2007 Revision Population Database. United Nations, Population Division. New York, NY: http://esa.un.org/unup/ (accessed October 17, 2010).

During the second half of the twentieth century, most South American governments have increasingly justified their urban development policies as necessary to overcome poverty. But contrary to the expectations of development, during this period the number and proportion of people living in conditions of extreme poverty grew in this region.[3] Driven by narrow technological and market parameters, the dominant neoliberal model has promoted expropriation of land and concentration of land ownership since the 1970s, which has had severe negative socio-ecological impacts.[4] When indigenous people and rural populations have been left without access to their regional land or marine habitats, they are forced into massive urban migrations with drastic decreases in their qualities of life. Even when local people are offered jobs by the new owners of the habitats (for example, oil companies or multinational fishery companies) their levels of autonomy are drastically decreased, and their traditional habits are disrupted (Rozzi 2001).[5] Both national and international pressures act over regional habitats and their human and other-than-human populations. For example, in the Amazonian Rainforests, one of the largest land expansions (175,000 km^2) belongs to the Royal Dutch Shell Company which has had a major impact on deforestation and mining pollution, recurrently violating Brazilian environmental laws.[6]

The accelerated rural-urban migration has generated a physical barrier between society and non-human nature, so that the knowledge that most people have about biological diversity is acquired today in urban contexts, distanced physically, emotionally and ethically from most biodiversity. Today, direct exposure to natural habitats, and the beauty and diversity of their inhabitants, has become an increasingly rare experience in everyday life, as well as in formal and informal education.[7]

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[3] An interesting discussion and collection of essays about the interrelations between poverty and environment in Latin American countries is presented by Ernesto Hajek, editor (1995), *Pobreza y Medio Ambiente en América Latina*, 579 pp. Buenos Aires: Centro Interdisciplinario de Estudios sobre el Desarrollo Latinoamericano. [in Spanish.]

[4] Cf. Amos Nascimento (2010) Environmental Philosophy in Brazil? Theoretical and practical reflections on a South American question. International Society for Environmental Ethics Newsletter. Volume 21 (1): 7–22.

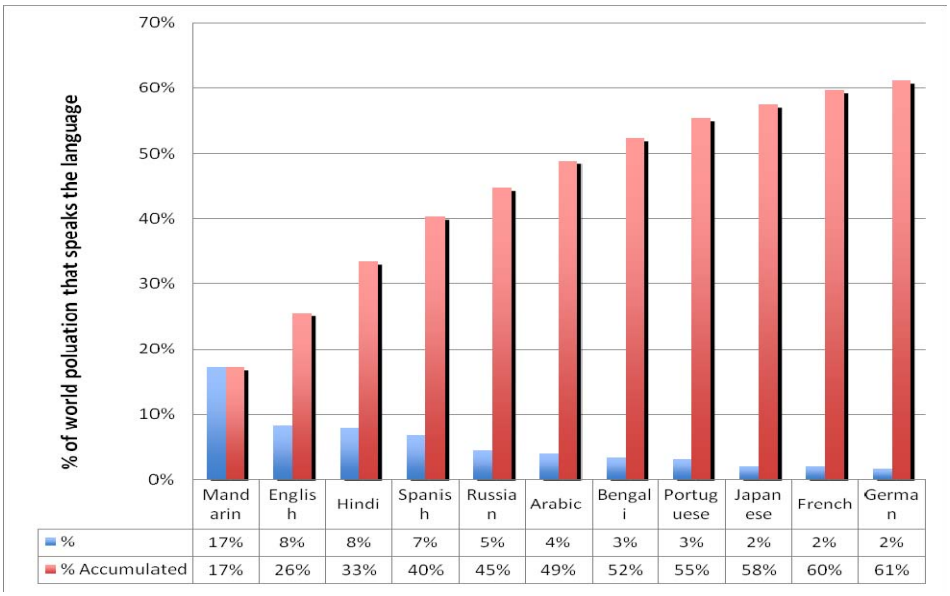
[5] Cf. Ricardo Rozzi (2001) Ética ambiental: raíces y ramas latinoamericanas. In: R Primack, R Rozzi, P Feinsinger, R Dirzo & F Massardo (eds), Fundamentos de Conservación Biológica: Perspectivas Latinoamericanas, pp. 311-359. Fondo de Cultura Económica, México.

[6] Eliane Ceccon & Octavio Miramontes (1999) Mechanisms and social actors in the deforestation of the Brazilian Amazon Mecanismos y actores sociales en la deforestación de la Amazonia brasileña. Interciencia 24 (2): 112–119.

[7] Cf. Peter Feinsinger, Laura Margutti & Ramona Oviedo (1997) Schoolyards and nature trails: ecology education outside the university. Trends in Ecology & Evolution 12: 115–120; Carl Leopold (2004), Living with the Land Ethic. BioScience 54: 149–154; Richard Louv (2005) Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder. New York: Algonquin Books.

I.2 Conceptual barriers

At the beginning of the 21st century, for the first time in the history of the human species, more than 50% of the world's human population speaks only one of the eleven dominant languages (Figure 2). According to the data of the Ethnologue (2009), 61.3% of the world population speaks Mandarin, English, Hindi, Spanish, Russian, Arabic, Bengali, Portuguese, Japanese, French and/or German.[8] These languages represent only a 0.1% of the 6909 living languages. Moreover, in formal education worldwide, less than 10% of the living languages are taught around the planet.[9] In this way, formal education represents a central indirect driver of losses of languages and cultural diversity.[10] This severe linguistic homogenization reduces the spectrum of both forms of ecological knowledge and environmental ethics, broadly understood as ways in which humans perceive and co-inhabit their regional habitats.



	Mandarin	English	Hindi	Spanish	Russian	Arabic	Bengali	Portuguese	Japanese	French	German
%	17%	8%	8%	7%	5%	4%	3%	3%	2%	2%	2%
% Accumulated	17%	26%	33%	40%	45%	49%	52%	55%	58%	60%	61%

Figure 2. Relative percentages of rural and urban world population since 1950, including estimated percentages until 2050.[11]

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[8] Lewis, M. Paul (ed.), 2009. Ethnologue: Languages of the World, Sixteenth edition. Dallas, Tex.: SIL International. Online version: http://www.ethnologue.com/ (accessed October 17, 2010).

[9] Cf. Michael Krauss (1992) The world's languages in crisis. Language 68: 4-10; Luisa Maffi (ed.) (2001) On Biocultural Diversity. Linking Language, Knowledge, and the Environment. Washington, D.C.

[10] Cf. Luisa Maffi (2005) Linguistic, Cultural, and Biological Diversity. In: Annual Review of Anthropology, Vol. 34, pp. 599–617.

[11] Source: Ethnologue Online version: http://www.ethnologue.com/ (accessed February 1, 2010).

The linguistic reduction generates a conceptual barrier between global society and other-than-human beings because 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 languages, and on dominant economic models that promote a utilitarian ethics.[12] This narrow linguistic and economic perspective reduces nature to mere "natural resources". Today's generalized notion of "natural resource" contrasts with many ecological Amerindian, and also subordinated Western worldviews, that emphasize instead a sense of kinship and community among humans and other-than-human beings.[13] For example, at the southern end of the Americas, the Yahgan people who have inhabited the Cape Horn archipelago, south of Tierra del Fuego for more than 5,000 years, begin many of their stories with the statement "in ancestral times when birds were still humans".[14] Mirroring this ancestral Amerindian notion of "human-bird kinship", in the U.S., in the middle of the 20th century, the 1944–1945 President of the ESA and father of contemporary land ethics, Aldo Leopold affirmed in his essay dedicated to the extinct passenger pigeon: "It is a century now since Darwin gave us the first glimpse of the origin of species. We know now what was unknown to all the preceding caravan of generations: That men are only fellow-voyagers with other creatures in the odyssey of evolution. This knowledge should have given us, by this time, a sense of kinship with fellow creatures; a wish to live and let live; a sense of wonder over the magnitude and duration of the biotic enterprise."[15]

II. HABITATS, HABITS, AND INHABITANTS

To illustrate the concepts of kinship and community of co-inhabitants rooted in ecological worldviews and practices that integrate the human inhabitants, their habits and habitats, I will concisely describe four cases from South America. Table 1 summarizes the four cases which offer complementary biological, linguistic, Amerindian, and creole emphasis to understand the vital links between the habitats and the habits of the co-inhabitants. These vital links are currently being disrupted by growing, foreign economic and development pressures that ignore and destroy the co-evolutionary interrelationships between the regional habitats and the habits of the inhabitants in each of these four cases.

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[12] Cf. Eugene Hargrove (2008), *A traditional and multicultural approach to environmental ethics at primary and secondary school levels*. Environmental Ethics 30: 263–271.

[13] Cf. Jay Baird Callicott, J. B. (1997), *Earth's Insights: A Multicultural Survey of Ecological Ethics from the Mediterranean Basin to the Australian Outback*. Berkeley, CA; Ricardo Rozzi and Alexandria Poole (2008) Biocultural and linguistic diversity . In "Encyclopedia of Environmental Ethics and Philosophy", Eds. B. Callicott & R. Frodeman, Volume 1: pp. 100–104. MacMillan Reference Book – Gale, Cengage Learning, Farmington Hills, Michigan.

[14] Rozzi et al. 2010b.

[15] Aldo Leopold (1949), *A Sand County Almanac*, pp. 116–7. Oxford University Press, New York.

Table 1. Four examples from South America that illustrate the biocultural links between regional habitats, the inhabitants and their habits. These vital links are currently disrupted by foreign development pressures.

Emphasis of the case	**Integration**	**Disruption**
Biological	Magellanic woodpeckers have co-evolved the habits of carving nests and feeding in the native forest habitats dominated by *Nothofagus* trees in southern South America.	Since 1977, exotic pine plantations have massively substituted the native forests of *Nothofagus* in southern Chile; consequently, today the Magellanic woodpecker is an endangered species.
Linguistic	Yahgan people in Cape Horn traditionally named places after the predominant habitat types and the most abundant animal and plant co-inhabitants; for example, *Upushuaia* means bay (*waia*) with abundant *upush* bushes.	The prevailing naming habit of European colonizers was to call the places in southern South America according to the conquerors of those places; for example, the capital city of Cape Horn is called Puerto Williams after Juan Williams.
Amerindian and scientific ecological knowledge	*Pewenche* people have co-evolved the habit of gathering seeds of the *pewen* or Monkey-Puzzle trees.	Today, the habitats of pewen forests are being flooded with hydroelectric dams. To retain their habitats and ancestral habits the Pewenche people are opposing private companies and government policies.
Biocultural diversity and monocultures	Mangroves in tropical South America are inhabited by myriad of living beings, including human communities whose women are called "*concheras*" because they have the habit of gathering shellfish ("*conchas*") in these habitats.	Since 1970, mangroves have been massively clear-cut, and substituted by shrimp pools. This process has determined massive losses of biodiversity, and the displacement of communities of *concheras* who have lost their subsistence source rooted in their native habitats and habits.

II.1. The Magellanic Woodpecker

At the southern end of the Americas, in the Cape Horn archipelago, inhabits the largest woodpecker species in South America. The Magellanic woodpecker (*Campephilus magellanicus*) is called by the indigenous Yahgan people: *lana*. This bird name derives from the Yahgan word *lan*, which means tongue.[16] It

[16] See Ricardo Rozzi and collaborators (2010), Multi-Ethnic Bird Guide of the Sub-Antarctic Forests of South America. Denton, TX/Punta Arenas, Chile.

alludes to the habit of this woodpecker of extending its long tongue to extract larvae from the holes it pecks in the trunk of old growth trees in the sub-Antarctic forests of the Magellanic archipelago. The scientific name of the bird also alludes to its feeding habit, and habitat. The Latin words define the bird as "caterpillar-lover" (*Campe-philus*), inhabiting the Magellanic forests (*magel-lanicus*). Its English common name, Magellanic woodpecker, also defines the identity of this bird by its habit of pecking wood in the austral woodlands. Hence, the intimate links between the habitats and the habits of this bird inhabitant is recognized by the ornithological knowledge and names of the indigenous, scientific, and common English languages.

The Magellanic Woodpecker is endemic to the *Nothofagus* forests of southern Chile and Argentina. It is so specialized in its habitat requirements that it nests solely in old trees of the genus *Nothofagus.* In the trunks of these trees, it excavates rounded cavities which provide nesting sites not only for woodpecker families, but also for numerous other cavity-nesting birds. In this way, this woodpecker creates homes for a variety of birds and is, therefore, a keystone species in the austral forest ecosystems. To find appropriate trees to nest and feed upon the Magellanic woodpeckers require large territories. Consequently, these woodpeckers are very sensitive to the degradation of the austral temperate forests and their replacement by exotic plantations of *Eucalyptus* and pine (*Pinus radiata*).[17] This species belongs to the same genus (*Campephilus*) of the two largest woodpecker species known worldwide: the Imperial Woodpecker (*C. imperialis*) and the Ivory-Billed Woodpecker (*C. principalis*), which inhabited the forests of North America, and today are presumed to be extinct due to the destruction of their habitats, and hunting pressures. Like their congeneric species from the Northern Hemisphere temperate forests, the Magellanic woodpecker will become extinct if the relationships between its habits and habitats are not understood and incorporated into conservation measures today.

II.2. Amerindian and conqueror names of plants and places

The Yahgan people, ancestral inhabitants of the Cape Horn region, traditionally named places after the predominant bird and plants species in the area.[18] For example, Grandmother Cristina Calderon, the last fluent speaker of the Yahgan language, told me that the bay where she was born was originally called *Upushwaia*, the bay (*waia*) of *upush* shrubs, the most abundant plant in the area.[18]

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[17] Ibid.18 See Patricia Stambuk (1986), Rosa Yagán: el Último Eslabón. Santiago de Chile: Ediciones Andrés Bello.

[18] See Ricardo Rozzi, Ximena Arango, Francisca Massardo, Christopher Anderson, Kurt Heidinger & Kelli Moses (2008a), Field environmental philosophy and biocultural conservation: The Omora Ethnobotanical Park's environmental education program. Environmental Ethics 30: 325–336.

Upon observing the bush growing in such abundance in the southern regions of Chile, the Spanish conquistadors associated the *upush* with the behavior of a weed (*zarza)*. The shape of its leaves reminded them of a small vine (*parrilla*). The Spaniards, who came to Cape Horn from a Mediterranean country, were reminded of vines predominant in their homeland, and they chose to call the shrub *zarza-parrilla*. The Anglican missionaries, who arrived from a temperate region dominated by moorlands and cultivated hedges, called this species *wild-currant*, because its fruit reminded them of the currants of their native country which in Cape Horn grow in the "wild". European naturalists and botanists followed the Aristotelian and Linnaean formula of scientific names composed of a substantive (essence) and an adjective (accident) when classifying the austral plants. British and French scientists determined that the bush belongs to the botanical genus *Ribes*, which has a worldwide distribution and includes 200 species. Because this species is characteristic of the sub-Antarctic Magellanic region of southern Chile, it was classified by European botanists first with the Latin scientific name *Ribes antarcticum* by Sydney Parkinson during Captain Cook's first expedition in 1769, a name changed later by Poiret to *Ribes magellanicum*. The former names given by Europeans to the austral plants illustrate how their familiar habitats and habits were projected onto the names of the new species they encountered in southern South America.

Place names are also expressions of the ways humans understand and relate to the habitats they inhabit. For example, at the end of the 19th century, *upush-waia* was named by Anglican missionary Frederick Lawrence as Puerto (Port) Luisa, after his daughter Luisa was born. In the mid 20th century, after the arrival of the Chilean Navy to the area, this toponomy was changed to Puerto Williams in memory of Captain Juan Williams, who in 1843 helped maintain Chilean sovereignty in the region before territorial disputes arose with Argentina. In the names of Puerto Luisa and Puerto Williams, the original inhabitants of Cape Horn—humans and non-humans—are absent; we remember instead the colonizers who took possession of the region. By reincorporating a Yahgan name like *Upshwaia* at the beginning of the 21st century, we recover the profound sense of living together with the plants and features of the landscape which are expressed by the indigenous language. By preserving an explicit reference to the bio-cultural diversity of the place, the Yahgan name helps to continue cultivating an indigenous environmental ethic that regards the place as belonging to the whole biotic community and not only to humans.

II.3. Co-inhabiting with trees: *Pewenche* and scientific ecological knowledge

Both, traditional ecological knowledge and contemporary ecological scientific knowledge allow us to understand the interrelationships between the regional habitats, the inhabitants and their habits. These vital links are essential

for the well-being of both the human and the other-than-human co-inhabitants, thereby generating the sustainability of Amerindian communities such as the largest indigenous group of southern South America, the *Mapuche* people. The *Mapuche* 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 land (= *mapu*), and the names of the three main Mapuche groups which refer to the habitats they inhabit:

— the *Lafkenche*, people of the *Lafken* or coastal ecosystems (36–40°S),

— the *Williche*, people of the *Willi* or south, inhabiting the evergreen rain forests from the Tolten River (38°S) south to Chiloe Island (42°S), and

— the *Pewenche*, people (=*che*) of the *Pewen* or Monkey-Puzzle tree (*Araucaria araucana*) forests of the volcanic Andean mountain range in southern Chile and Argentina (37–40°S).

The *Pewenche* people have been opposing the construction of dams in their territories since the 1980s. This construction would flood their ancestral habitats, the *pewenlemu*, a type of forest (*lemu*) dominated by the *pewen* trees. The social organization and ancestral distribution of the *Pewenche* clans is closely associated with the particular distribution of patches of *pewen* trees on the volcanic soils.[19] An essential habit of the *Pewenche* is the *pica*, or the gathering of the monkey-puzzle tree cones, whose seeds provide the nutritive foundation of their diet. As illustrated in Figure 3, 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. Among the fruits and seeds available in the *Pewenche* territory, the *pewen*'s seeds have the highest levels of methionine. We found that the seeds contained in these cones posses 0.110g/100g and 0.130g/100 g of cysteine and methionine, respectively.[20] 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 source, such as the pewen seeds. Consequently, this analysis from the medical science perspective provides a functional explanation of this habit, since the trees are fundamental to the diet and health of the *Pewenche*, given that its seeds provide the primary source of methionine available in the volcanic ecosystems in mountain altitudes. Our medical sci-

[19] See David Aagesen (1998) Indigenous resource rights and conservation of the Monkey-puzzle Tree (*Araucaria araucana*, Araucariaceae): A case study from Southern Chile. In: Economic Botany, Vol. 52, pp. 146–160.

[20] Cf. Ricardo Rozzi & Francisca Massardo (2001) Similitudes y diferencias interculturales en las éticas ambientales. In "Fundamentos de Conservación Biológica: Perspectivas Latinoamericanas" (Primack, R., R. Rozzi, P. Feinsinger, R. Dirzo, F. Massardo), pp. 319–321. Fondo de Cultura Económica, México.

ences analyses also allow us to scientifically 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 and welfare arise from this trophic socio-ecological relationships, which can be understood from both the *Pewenche* worldview and the scientific analysis.

The name *Pewenche*, and its people's ancestral worldview also finds a point of convergence with a scientific ecosystemic perspective. Figure 3 illustrates an analysis of nutrient flows in high-Andean ecosystems inhabited by the *Pewenche:*

(1) The entrance of sulfur (S) 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.

(2) 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), which in this chemical form can be absorbed by the roots of the *pewen*.

(3) 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 aminoacids that contain sulfur: methionine and cysteine.[21]

(4) 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 *Mapuche*, "people of the land". Symbolic-linguistic and physical-biotic bodies are interwoven in this profound integration of habitats, habits, and co-inhabitants.

[21] Ibid.

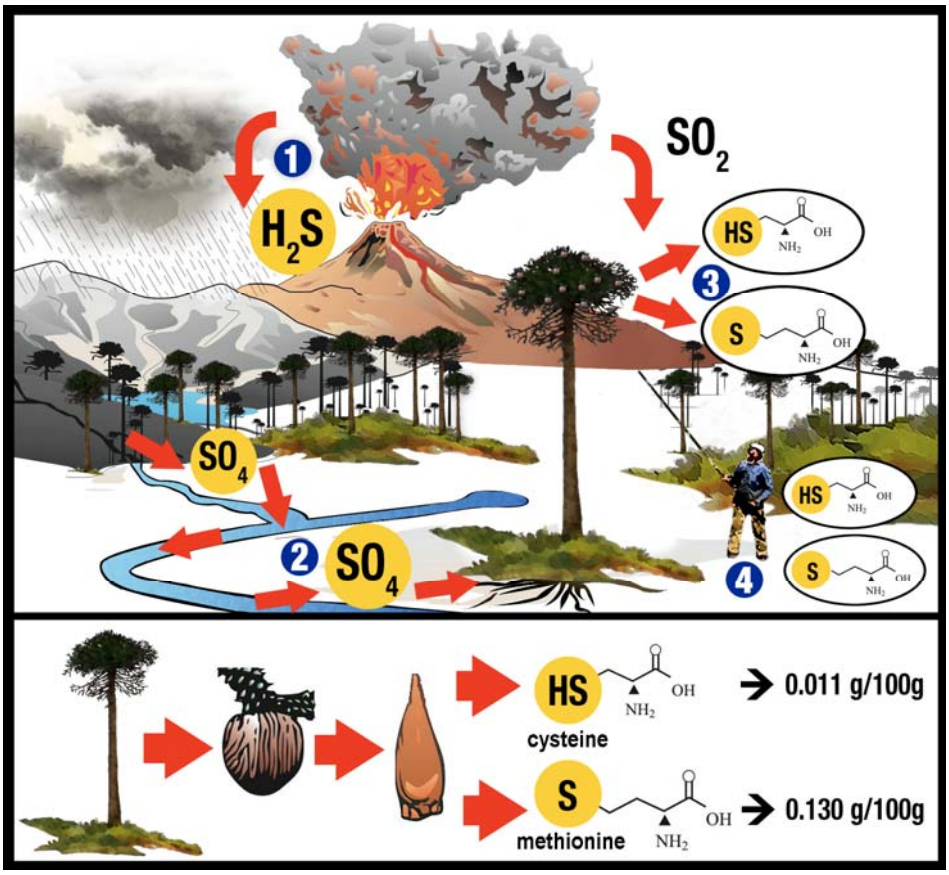

Figure 3. A scientific biogeochemical perspective agrees with the integration of *habitats, habits, inhabitants* expressed by the *Pewenche* worldview. *Habitat = Pewen-lemu or monkey puzzle (Araucaria araucana) forest*; *Habit = Gathering of the pewen seeds or pica*; *Inhabitants = Pewen-che*. The description of the biogeochemical cycle of sulphur (S) illustrated by the figure is described in the main text.[22]

II.4. Mangroves, *concheras* and shrimp pools: disrupting habitats and habits in tropical South American communities

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

[22] Figure modified from Rozzi et al. (2008), Environmental Ethics 30: 325–336.

country became the world's principal producer of shrimps in 1983.[23] This boom involved such a large environmental impact that today the extension of shrimp pools surpasses that of mangroves along the Ecuadorian coast (see Figure 4).

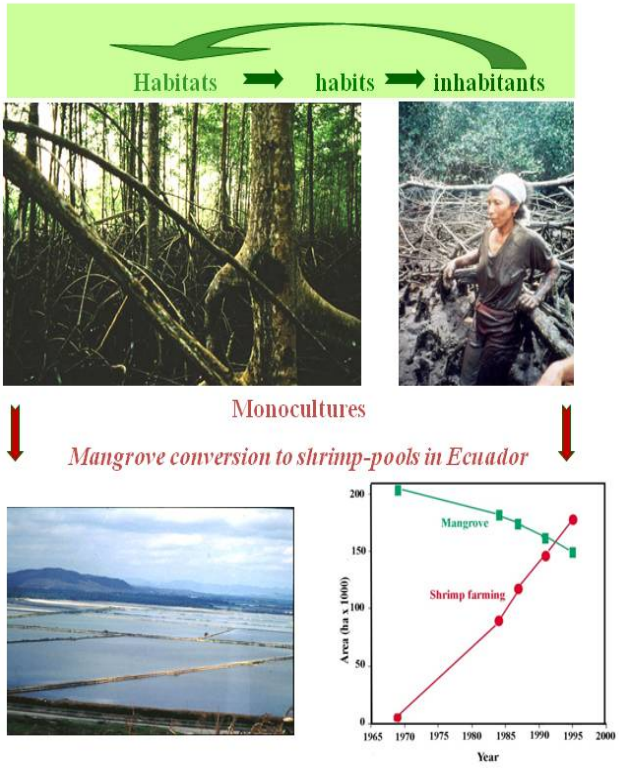

Figure 4. Relationships between the mangrove habitats and the habit of gathering shellfish, algae, and fishes by the *conchera* women in north-western Ecuador (above). Clear-cut and conversion of mangroves into shrimp pools (below).[24]

Mangroves are key habitats for diverse inhabitants in tropical regions of the world. They act 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

[23] Luis Suárez & Doris Ortiz (2006), Producción de camarones y destrucción de manglares en Ecuador. In: Primack, R.; Rozzi, R.; Feinsinger, P.; Dirzo, R.; Massardo, F. (eds): *Fundamentos de Conservación Biológica: Perspectivas Latinoamericanas.* 2nd edit. México City, México (Fondo de Cultura Económica), pp. 195–197.

[24] Figure modified from Suárez & Ortíz 2006, p. 196.

industries also discharge contaminated waters and divert the course of streams and rivers. These industries causes 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 molluscs that depend on mangroves at some phase of their life cycles,[25] and the health of humans who traditionally gather and consume shrimps, crabs, oysters and other organisms in these coastal habitats.[26] This illustrates 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 this country.

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.[27] The majority of these women and their communities are African descendents, and conscious about how the explosive growth of shrimp exportation entails a contrasting misery for the coastal inhabitants of Ecuador, on March 11, 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 in the out-

[25] Cf. Verónica Mera (1999) Género, Manglar y Subsistencia. Ediciones. Abya-yala: Quito, Ecuador.

[26] Cf. Mike Hagler (1997) Shrimp – The Devastating Delicacy. Greenpeace Reports

[27] Ibid.

> skirts 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."[28]

The *conchera* expresses the vital bonds of her community to the coastal habitats. Her criticism also makes 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 90% of the shrimp produced and exported by companies based in Ecuador are consumed only by people of three regions: USA (51%), Japan (27%), European Union (17%).[29] In addition habitat degradation is frequently caused by a few companies, and not by "the poor" as it is frequently presented. 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 or easily violated to favor shrimp industries, which limit or forbid access to the traditional users of mangroves by means of government concessions.

As a result of the local opposition, in alliance with national and international partners, the government established a biological reserve of mangrove ecosystems in Provincia Esmeraldas in 1995 and, in 1999, created a presidential decree that forbids the cutting of mangroves in Ecuador. These changes to the legislation point to some causes of the rapid environmental degradation occurring in the subcontinent with the highest biodiversity of the planet. This case provides some hope for a better integration between environmental and social policies by showing that numerous regional populations are aware of the intimate connections between the well being of human and other-than-human co-inhabitants in their regional habitats.

The case of Ecuadorian shrimps could apply to innumerable analogous cases throughout South America that affect local cultures that are already living sustainably with their local ecosystem, and whose habits and ways of living are disrupted by development practices that do not take this local connection into account. Historical analyses of the post-Columbian history of the Americas find that large-scale exploitation, as well as monocultures that replace native habitats, have been associated repeatedly with ephemeral economic booms that left behind degraded social and ecological environments.

III. THREE WAVES OF BIOCULTURAL HOMOGENIZATION: THE CASE OF SOUTHERN CHILE

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[28] In Joan Martinez-Alier (2001) Ecological Conflicts and Valuation: Mangroves versus Shrimps in the Late 1990s, pp. 715–716. Environment and Planning C, Vol. 19, pp. 713–728.

[29] Cf. Suárez & Ortiz 2006 (see note 24).

A historical analysis of the post-Columbian colonization processes in southern Chile helps to understand how the unique and diverse mosaic of ecosystems and biological species, cultures, and languages have been progressively replaced by a few biological species and almost a single language and culture. These biocultural homogenization processes are the outcome of a violent conquest, overpowering the resistance of local inhabitants. Today the intensity of this violent suppression of biological and cultural diversity seems to be greater than ever. Instead of a post-colonial period we are living in the middle of an *ultra-colonial* era. To illustrate this incremental colonialism in southern South America better, we can distinguish three main waves of transformation of the forest landscape and its associated indigenous cultures since the Spanish arrival in Chile in 1537.

III.1. First wave of biocultural homogenization: Spanish conquest (1500–1800)

A first wave of strong ecological and cultural transformation of the austral landscape occurred during the sixteenth, seventeenth, and eighteenth centuries. The initial contact with the Spanish conquerors brought the spread of virulent epidemics caused by Eurasian microbes to which the New World inhabitants lacked any resistance. For example, smallpox arrived in Peru around 1526, killing most of the Inca population including the emperor Huayna Capac. Smallpox facilitated the campaign of Pizarro in Peru and later, in 1540, the entrance of the Spaniards to Chile. Although southern Chile is cited as an exemplary case of Indian resistance because the *Mapuche* constantly fought the Spanish advance, stopped the Europeans at 39°S, and killed the colony's founding governor Pedro de Valdivia in 1535, this resistance was at the expense of many *Mapuche* lives. From 1541 to 1664 the austral fighting killed 30 000 Spanish soldiers, and some chronicles suggest 10 times as many *Mapuche*. The answer of the Crown of Spain to the courageous resistance of the *Mapuche* to defend their habitats against the brutal invasion of the Spaniards, was to reverse the Indian-slavery policy, by specifically permitting enslavement of "rebellious" Chilean natives in an effort to punish the austral Indians, encourage Spanish settlers, and maintain Chile's labor supply. In contrast with the rest of sixteenth-century Latin America, Chilean Indians taken in war were legally put to work as slaves until 1674.[30]

The establishment of Spanish villages and ranches involved a drastic change of the *Mapuche* habitats. The Spaniards increased drastically the extraction of fuel wood and valuable woods for construction and furniture, including the now endangered cypress species, the Chilean Incense-cedar (*Austrocedrus chilensis*),

[30] Cf. José Bengoa (1999), Historia del Pueblo Mapuche: Siglo XIX y XX. Santiago de Chile: LOM Ediciones.

and several species of endemic *Nothofagus* trees, such as the critically endangered *Nothofagus alessandri*.[31] In addition, to open land for agriculture and cattle, the Spaniards burned large expanses of Mediterranean sclerophyllous and deciduous forests in central Chile. The introduction of farm animals—mainly hens, goats, sheep, pigs, donkeys, cattle, and horses—rapidly transformed grasslands never grazed before with such intensity, initiating processes of erosion and forest disturbance whose impact is still evident today. Concomitantly, the culture of native people was deeply and rapidly transformed by the introduction of those animals that are today inseparable components of indigenous and non-indigenous rural culture in southern Chile**.**

III.2. Second wave of biocultural homogenization: post-independence Eurocentric modernization (1800–1950)

The actions described above were often criticized by liberals who supported Chilean independence from Spain in 1818. Paradoxically, the nascent, independent nation state became more Eurocentric than the previous monarchic colony. Consequently, an even more intensive second wave of ecological and cultural transformation began after Chile gained its independence rapidly establishing commercial and political relationships with Great Britain, Germany, and other European countries. As with many young independent Latin American countries, Chile promoted the immigration of Europeans not only to enlarge the labor force, but also to raise the level of national culture. Europe was perceived more than ever as the home of true civilization and European immigration was the obvious shortcut to faster modernization and development.[32] As a result, between 1860 and 1900 the Chilean minister Vicente Pérez-Rosales welcomed German immigrants, especially farmers, who burned great expanses of evergreen forest in Chile's lake region (39°S–42°S), opening up land for agriculture and cattle.[33]

Meanwhile, the new oligarchy was entrenched in the urban culture of Santiago, insensible to those changes. This alienation and lack of sensitivity for Chilean native habitats and cultures prompted the new oligarchy, tagged the *clase derrochadora* (the spendthrift class), to promote unlimited use of woods, development of extensive monocultures of wheat, and other forms of intensive exploitation that led in two or three decades to severe environmental degradation

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[31] Claudio Donoso & Antonio Lara (1996), Utilización de los bosques nativos en Chile: pasado, presente y futuro. In: Armesto J.J., Villagrán C. and Kalin M.T. (eds) Ecología de los Bosques Nativos de Chile, pp. 363–387. Editorial Universitaria, Santiago, Chile.

[32] Vicente Pérez-Rosales (1882), Recuerdos del Pasado. Third edition (1971), Editorial Francisco de Aguirre, Santiago, Chile.

[33] Ingrid Schmalz I (1970), Dokumente zur Geschichte der Deutschen Einwanderung. Heft I: Carl Alexander Simon. Berlin Karl Ilg (1982), Das Deutschtum in Chile und Argentinien. Eckartschriften Heft 83. Oesterreiche Landmanschaft. Vienna, Austria.

with erosion problems that persist today. Concurrently, the Chilean government undertook a single-minded military campaign to "pacify" the *Mapuche*. These indigenous groups who had fiercely and successfully defended their lands since the arrival of the Spanish, and even before against the Inca, could no longer prevail against the well-armed Chilean military, and they finally surrendered in 1883. As was happening simultaneously across the Andes in Argentinean Patagonia, these nomadic or semi-nomadic people of the land were herded out of their native habitats onto marginal reservation lands, while the most productive regions of their former territories were granted to colonists from the north and south, or to German, Italian, and Swiss immigrants.

Toward the end of the 19th century, the southern tip of the Americas began to attract other European colonists, including British, Yugoslavs and Scots, who initiated the large-scale sheep ranching that drastically changed the landscape by the end of the nineteenth century. The nomadic Fuegians, used to hunting guanaco (*Lama guanicoe*), began to hunt sheep, a practice that accelerated the slaughter and displacement of Fuegians from their ancestral lands. With the losses of habitats and the degradation of the habits of Fuegian people, new diseases and alcoholism spread out provoking severe acculturation of the Yahgan people whose language had nearly vanished by the middle of the twentieth century.[34]

The historical analysis of the second wave of ecological and cultural transformations shows that after independence local oligarchies exacerbated the European imprint on the landscape and culture through their aim of modernizing the country. More recently, in the 20th century the impact of economic-centric approaches has imposed an even greater pressure on the local eco-cultural systems.

III.2. Third wave of biocultural homogenization: Post–World War II *ultra-colonialism* driven by global "monetarization" (1950–2000)

After World War II the project of modernization of the Chilean state-nation has become increasingly reduced to a project of "monetarization" driven by the globalization of neoliberal economy. The reduction of modernization into "monetarization" has drastically intensified processes of biocultural homogenization, which with ever growing rates began to expand over the whole territory. Since the middle of the twentieth century the development of the forest plantation industry and campaigns to assimilate fully the indigenous cultures into Chilean society have promoted an even more intensive third wave of transformation of the landscape and social order of southern Chile. For example, since

[34] Cf. Aylwin J. (1994), Pueblos indígenas de Chile: antecedentes históricos y situación actual. Serie de Documentos, no. 1. Instituto de Estudios Indígenas. Universidad de la Frontera, Temuco, Chile; Aylwin J. (1995), Comunidades indígenas de los canales australes: antecedentes históricos y situación actual. Corporación Nacional de Desarrollo Indígena. CONADI, Temuco, Chile.

1940 Chilean forestry has become increasingly dependent on plantation monocultures of the Monterrey pine (*Pinus radiata*) at the expense of native forests. The latter continue to be clear cut, burned, and replaced with plantations, and since the early 1980s the Chilean government has accelerated this process through subsidies (Decree 701) and development of large *Eucalyptus* plantations.[35] Besides losses in biodiversity, the massive substitution of native forests by exotic monocultures causes soil erosion and compactness and is detrimental to the hydrological cycle, provoking floods during winter and droughts during summer. In addition to ecological consequences, the large-scale replacement of native forests by exotic plantations has severe socioeconomic impacts. A strong migration of rural population to urban centers is promoted because:

— small owners sell their lands to companies;

— forestry requires less labor than agriculture, and labor is required only during intermittent years, for planting, thinning, and cutting;

— most of the labor force comes with companies from other regions in Chile; and

— other multiple uses and values of native forests are eliminated.

The living conditions of the *Mapuche* Indians have declined dramatically with the transformation of native forests into homogenous plantations of exotic trees. Life within the reservation system became increasingly difficult due to population growth and soil erosion associated with imported agricultural practices. From 1974 onwards, the situation was further aggravated by increased expropriation of ancient lands and the subdivision of *Mapuche* communities. During the 1970s and 1980s, Chile's military regime enforced programs to replace the traditional *rukas* (*Mapuche* huts) with modern houses, and to eliminate the Mapudungun language from formal and informal education.

Today, southern Chile presents an economy and culture based on exotic species and, in consequence, on an increasingly homogeneous landscape. During the 1990s, *Pinus radiata* accounted for more than 90% of the milled wood exported by Chile, 80% of the plant species used by Chilean Pharmaceutical Industry of Natural Products were exotics, and central plazas of cities in southern Chile are now dominated by exotic trees. School textbooks used in Chilean schools between 1975 and 1995 focused on examples of flora and fauna from distant regions, mainly Europe and Africa, and fewer than 20% of the illustrated or described examples were native plants or animals. Furthermore, no mention of traditional forms of botanical or zoological knowledge were included during that period, and the decoration in classrooms of southern Chile was based on

[35] Cf. Ricardo Rozzi, John Silander, Juan Armesto, Peter Feinsinger & Francisca Massardo. 2000. Three levels of integrating ecology with the conservation of South American temperate forests: The initiative of the Institute of Ecological Research Chiloé, Chile. Biodiversity and Conservation 9: 1199–1217.

exotic biotic and cultural motifs, such as Mickey Mouse.[36] From the time children begin school their view is directed not to regional ecological or cultural environments, and it is no longer directed to European universal culture, but to a progressively narrow monetary view and valuation of life.

IV. FIELD ENVIRONMENTAL PHILOSOPHY

At the southern end of the Americas we developed a methodological approach that we call "field environmental philosophy" (FEP), to counterbalance the alienation of development models, policy making, and educational programs from regional habitats, the inhabitants and their habits, and to enhance the understanding about the essential value that biocultural diversity has for sustainability.[37] FEP emphasizes ecologically and philosophically guided field experiences in local habitats, socio-cultural communities, and regional institutions, designed to stimulate the perception of and valuation toward biological and cultural diversity in specific places and moments.

In the context of current global change, to effectively implement FEP 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 2000 we created the Omora Ethnobotanical Park in Cape Horn at the southern end of the Americas. In order to integrate programs at multiples scales, we established a nested organization model that integrates the work of the Omora Park at the:

— **Local scale,** it functions as a research, education, and conservation center in the UNESCO Cape Horn Biosphere Reserve.

— **National scale,** it is the southernmost site of the Chilean Long-Term Socio-Ecological Research network coordinated by the Institute of Ecology and Biodiversity (IEB).

— **International scale,** it serves as a reserve and field station of the Sub-Antarctic Biocultural Conservation Program, coordinated by the Universidad de Magallanes and the University of North Texas (UNT).[38]

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[36] Ibid.

[37] Ibid.

[38] The multiple scale approach of the Omora Ethnobotanical Park and the Sub-Antarctic Biocultural Conservation Program is described in detail in Ricardo Rozzi and collaborators (2010), 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: 27–68.

Based on the experience we have gained from the Sub-Antarctic Biocultural Conservation Program at Omora Park, with participants from academic institutions, the community and the Chilean government, we have identified, *a posteriori*, ten principles that have been effective for the integration of long-term biocultural research and environmental philosophy into educational programs and policy making (adapted from Rozzi et al. 2006a):

1) Place-based experiences with decision makers, researchers and other participants that allows them to have "direct encounters" (face-to-face) with human and non-human beings in their regional habitats;

2) Transdisciplinary integration of sciences, arts, philosophy and environmental decision making;

3) Identification and implementation of charismatic species such as the green-backed fire-crowned hummingbird (*Sephanoides sephaniodes*), or *omora* in Yahgan language that represents a little bird, spirit and human hero, and today symbolizes the regional biocultural richness;

4) Continuous communication of results, conflicts, and actions through the media;

5) Participatory approach, where researchers not only provide information but collaboratively work in education and conservation with others;

6) Cross-institutional cooperation to bridge the work of academics, with the day-to-day life of the community, and decision making processes in government agencies;

7) Creation of collaborative, multiple scale networks with research, education and/or conservation centers at local, regional and international levels to facilitate the identification of causes of socio-ecological problems at diverse geopolitical scales, and propose and implement solutions for them;

8) Economic sustainability through strategies that link ecosystems and local trade practices with national and international economies, such as ecotourism;

9) Administrative sustainability through the establishment of infrastructure, conservation areas and territorial planning, such as the UNESCO Cape Horn Biosphere Reserve;

10) Conceptual sustainability through adaptive, transdisciplinary, site-based, long-term research, education and conservation programs, which are attuned to the ever-changing political, economic and environmental systems, at local, national and international scales.

In other articles I have described in detail the ten principles that have guided the contribution of the Omora Ethnobotanical Park for the creation of the Cape Horn Biosphere Reserve, and the establishment of a sub-Antarctic biocultural research, education and conservation program.[39] In this essay I want to conclude

[39] The ten guiding principles of the Omora Ethnobotanical Park program are described in Ricardo Rozzi, Francisca Massardo, Christopher Anderson, Kurt Heidinger & John Silander Jr.

by concisely describing FEP's methodological approach. At the University of Magallanes (UMAG) and other academic institutions, we were faced with the challenge of designing new methodologies and curricula to enable graduate students to systematically and formally integrate environmental ethics and ecological sciences into a long-term biocultural research, education, and conservation program. As a result, in 2003 we created the first graduate program in southern Patagonia: a Masters of Science degree in Biocultural sub-Antarctic Conservation at UMAG. To incorporate FEP in this graduate program it was essential to include field experiences in which philosophers, authorities, students, and other 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 ecologists and other researchers. Based on these experiences we designed an interrelated four-step cycle summarized in Table 2 to integrate environmental ethics and ecological research into innovative biocultural education and conservation activities, including ecotourism.

Table 2. Four-step cycle of field environmental philosophy.[40]

Step	Description
Step 1: *Interdisciplinary Ecological and Philosophical Research*	FEP investigates aspects of both biological and cultural diversity, including the diversity of values and perceptions about biocultural diversity held by participants from different disciplines, institutions, and socio-cultural groups, who speak different languages, and hold different forms of ecological knowledge and practices.
Step 2: *Composition of metaphors and communication through narratives*	FEP requires that graduate students compose metaphors and narratives with two complementary intentions: (i) to establish an engaging and clarifying dialogue with the general public, and (ii) to integrate the ecological and philosophical findings (step 1) through analogical thought that leads to a conceptual synthesis of facts, values and actions in biocultural education and/or conservation. The practice of composing metaphors has helped students to understand the ancient meaning of the Greek term *poeisis*, and to consciously integrate the dialectic relationship between invention and discovery into their research and conservation experiences.
Step 3: *Field activities guided with an ecological and*	For students and other participants in FEP, the experience of direct or "face-to-face" encounters with living beings in their habitats, has been essential to understanding biocultural diversity not only as a concept, but as an experience and awareness of co-

(2006), Ten Principles for Biocultural Conservation at the Southern Tip of the Americas: The Approach of the Omora Ethnobotanical Park. Ecology & Society 11(1): 43. [online] URL: http://www.ecologyandsociety.org/vol11/iss1/art43/

[40] Table adapted from Rozzi et al. 2010 (see note 39).

ethical orientation	inhabiting with diverse human and non-humans beings. Ecologically and philosophically guided field activities, such as "Ecotourism with a Hand-Lens in the Miniature Forests of Cape Horn," transform not only the knowledge about biocultural diversity, but also the ethics of living together with the diverse inhabitants with whom we coexist in regional ecosystems.
Step 4: *Implementation of areas for in situ biocultural conservation*	FEP requires students to participate in the implementation of *in situ* conservation areas, such as the interpretive trail of the "Miniature Forests of Cape Horn," to: i) protect native habitats, species, and ecological interactions; ii) enable visitors to observe and enjoy these habitats and ecological interactions, and to have the experience of coexisting with diverse human and other living and non-living beings, immersed in their habitats; and iii) foster a sense of responsibility as citizens who are ecologically and ethically educated, and proactively participate in the care of the diversity of habitats, and their various forms of life.

The FEP four-step cycle helps students and other participants to not only gain understanding about scientific and traditional ecological knowledge and practices, but also an ethical experience which recovers the pre-Socratic meaning of ethics.

The word *ethics* originated from the Greek term *ethos*, which in its more archaic form meant a *den*: the dwelling of an animal. By an extension of the use of this word, its meaning came to include the dwellings of human beings. Later this noun also became the verb *to dwell*. This dual interpretation of the Greek term *ethos*—as a noun and a verb—was later expressed by two Latin words: habitat and to inhabit.[41] In turn, inhabiting a particular habitat generates in the long-term recurrent forms of inhabiting; i.e., habits that configure the *ethos* or identity of the human and other-than-human inhabitants. In this etymological drift, our understanding of the concept of *ethos* moves from its meaning as a *vital physical space* (the habitat) toward its meaning as *vital movement* (to inhabit), and both meanings are interwoven in the performance of the *vital being* (the inhabitant), whose identity emerges from its habits or recurrent forms of inhabiting in the habitat.

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, which for the Yahgans as well as for contemporary scientific ecosystem studies in Cape Horn include the

[41] See H. G. Liddell, R. Scott, *A Greek-English Lexicon*, 9th ed. (New York: Oxford Press, 1996). See also J. Gonzalez, *El Ethos, Destino del Hombre.* (Mexico City: Fondo de Cultura Económica, 1996), pp. 9–12.

moon, the sun, the waters, the birds, the mosses, and the wind. Under this biocultural perspective, the cultivation of the moral character as much as the cultivation of land arises embedded in the plots of co-inhabitation: interweaving physical, biotic, and symbolic bodies, ecosystems and cultures.

The archaic meaning of ethos that integrates habitats, habits and co-inhabitants, has remained absent from most modern ethics, which have been largely developed with a universal and abstract focus that ignores the habitat: "as if" humans and their identities could exist in isolation from their habitats and non-humans co-inhabitants. Under the absence of the habitat in its conceptual horizons, modern ethics has been essentially anthropocentric; i.e., centered exclusively on the human inhabitants and their habits.

The conceptual omission of the links between habitats and habits has also sustained a Eurocentric approach of the prevailing modern ethics. During the colonial era, modern ethics developed in Europe have been 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 (a primitive legacy). During our current free market era, a prevailing utilitarian ethics centered on monetary cost benefit analyses continues overriding moment to moment a plethora of diverse forms of ecological knowledge and ethics present in the communities of South America, and other regions of the world.

Since the 1970s, Latin American liberation philosophy and liberation pedagogy, which emphasize the need to allow the expression of the pluriversal epistemologies and local histories of communities that exist at the borders of globalization.[42] 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.[43] I emphasize 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 both human and other-than-human beings. In this essay we have demonstrated that this integration finds strong support in at least three families of worldviews: contemporary ecological sciences, ancestral Amerindian ecological knowledge, and Western pre-Socratic philosophical roots expressed in the archaic meaning of ethos.

At the beginning of the 21st century, the reintegration of the habitats of a region, the inhabitants and their habits into ethics enables a liberation from global

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[42] See Ricardo Rozzi (2010), *Filosofía Ambiental Latinoamericana.* In "El Pensamiento Filosófico Latinoamericano, del Caribe y 'Latino' (1300–2000). Historia, Corrientes, Temas y Filósofos". E. Dussel, E. Mendieta & C. Bohórquez (eds.), pp. 434–445. Siglo XXI, México.

[43] Cf. Paulo Freire (1970), Pedagogy of the oppressed. New York: Continuum; Enrique Dussell (1980) Liberation Philosophy. Orbis Books, New York; Leonardo (1995) Ecology & Liberation. Orbis Books, New York.

anthropo-centrism, Euro-centrism, and monetary-centrism. Field environmental philosophy (FEP) affirms a diversity of ethics rooted in the histories of coexistence among co-inhabitants and their co-evolutionary histories in the biocultural landscapes of each region. FEP critically assesses prevailing modern ethics by identifying how these ethics are linked to the habitats and habits of European inhabitants, who with a colonial assumption of universalism fail to recognize the regional ethos that have long coexisted, and still coexist in the "New World". Instead, FEP stimulates the cultivation of diverse environmental ethics rooted in specific, regional biocultural units of habitats-habits-inhabitants.

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ABOUT THE AUTHOR — Ricardo Rozzi is a Chilean philosopher and ecologist. An associate professor at the Department of Philosophy and Religion Studies, University of North Texas, and associate researcher at the Institute of Ecology and Biodiversity and the University of Magallanes in Chile. Rozzi is the director of the Sub-Antarctic Biocultural Conservation Program (www.chile.unt.edu). Email: rozzi@unt.edu