

## Chapter 14

# The “3Hs” (*Habitats, Habits, Co-in-Habitants*) of the Biocultural Ethic: A “Philosophical Lens” to Address Global Changes in the Anthropocene

Ricardo Rozzi, Francisca Massardo and Alexandria Poole

**Abstract** Global culture, forms of governance, economic and development models have become drastically dissociated from biological and cultural diversity and their interrelationships. Global society is exposed to globally homogeneously governed life habits that tend to build globally homogeneous technological and urban habitats in the heterogeneous regions of the planet. Concurrently, these globally homogeneous habitats reinforce globally homogeneous life habits. These feedbacks between globalized habits and habitats generate processes of *biocultural homogenization*, which represents an overlooked dimension of global changes in the Anthropocene. Biocultural homogenization is both driver and product of complex and pervasive losses of biological and cultural diversity. We maintain that it is technically necessary and ethically imperative to reverse these losses. Toward this aim, we present the “3Hs” (*Habitats, Habits, co-in-Habitants*) conceptual framework of the biocultural ethic, which values the vital links among the diversity of life *habits* of distinct (human and other-than-human) *co-in-habitants* that share a common *habitat*. We offer this philosophical framework as a heuristic model for: (1) better understanding multi-dimensional and multi-scale processes involved in global changes; (2) designing policies that integrate biocultural diversity into ethical, political, and environmental dimensions of the contemporary technological world; and (3) orienting decision-making processes that can better assess the consequences that development policies might have for the conservation or degradation of habitats, life habits, and welfare of co-inhabitants. In this way, the 3Hs “philosophical lens” of the biocultural ethic can

---

R. Rozzi (✉)

Department of Philosophy and Religion, University of North Texas, Denton, USA

e-mail: Ricardo.Rozzi@unt.edu

R. Rozzi · F. Massardo

University of Magallanes, Puerto Williams, Chile

R. Rozzi · F. Massardo · A. Poole

Institute of Ecology and Biodiversity, Puerto Williams, Chile

A. Poole

Department of Politics, Philosophy and Legal Studies,

Elizabethtown College, Elizabethtown, USA



contribute to re-orienting global society toward sustainable forms of co-inhabitation amidst the rapidly changing socio-environmental scenarios of the Anthropocene.

**Keywords** Biocultural homogenization · Environmental justice · Ethics · Latin American philosophy · Traditional ecological knowledge

### 14.1 Biocultural Homogenization: An Overlooked Driver of Global Changes

The Anthropocene represents a new geological era in which the degree of influence that humans have over the biosphere exceeds that of other natural forces.<sup>1</sup> To realize that global society is an anthropogenic agent with a power of change that surpasses the power of the geological forces that shape the planet Earth dissolves old dichotomies between “biophysical” and “cultural” dimensions of reality. Today, globalized life-habits are causing rapid changes in global climate, stratospheric ozone, ocean acidification, the nitrogen and phosphorus cycles, pollution, biodiversity losses, land-use change and freshwater use (Steffen et al. 2011). It becomes necessary to adopt a biocultural prism to understand the position of the human species amidst the Anthropocene, and introduces us to a characteristic that transcends the purely descriptive plane: to affirm that human agency has become the main force that shapes the face of the Earth, raises questions of ethics (Rozzi 2015a).

We aim to contribute to this volume entitled *Global Changes: Ethics, Politics and the Environment in the Contemporary Technological World* by highlighting that in the Anthropocene not only technology but also culture, governance forms, development and economic models that drive global society have become drastically dissociated from (and indifferent towards) biological, linguistic, and cultural diversity and their interrelations. In this chapter, we use the philosophical framework the biocultural ethic (Rozzi 2012a) to address problematic divisions between cultural and biophysical dimensions of reality, which underlie global changes and socio-environmental injustices.

Regarding *ethics*, modernity and coloniality have 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” (Rozzi 2012a, 27). The conceptual omission of the links between habitats and habits has 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” (Rozzi 2012a, 27). This has led to an

---

<sup>1</sup>To mark the beginning of the geological era of the Anthropocene, different authors have proposed dates as dissimilar as the origin and expansion of agriculture about 3000 years ago or the so-called Great Acceleration that has escalated since the mid-twentieth century (Leis and Maslin 2015; Zalisiewicz et al. 2015; Waters et al. 2016). We agree with the date identified by Zalisiewicz et al. (2015) as a distinct moment for the Anthropocene’s start: the end of the Second World War (Rozzi 2015a).



erosion of communities that have values interlinked with their land, freshwater, and marine habitats (Maffi 2007). In turn, due to the displacement of indigenous and other local communities, these native habitats have lost their stewards and custodians. Consequently, native habitats (including the diverse communities of human and other-than-human living beings that inhabit them) are now more vulnerable to non-sustainable development practices (Rozzi 2013).

Regarding development and economic *policies*, after World War II a major trend embedded in the neoliberal development agenda (see Escobar 1995) has impelled intensive processes of rural–urban migration worldwide (Rozzi 2015a; Lenzner et al. 2018). 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 (Flavin 2007). The intensive rural to urban migration is a 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. In the twenty-first century, land grabbing and other forms of concentration of land ownership are becoming a major driver for the accelerated rates of rural–urban migration in Africa, Asia, and Latin America (Borras et al. 2011, 2012; Makki 2018; Lenzner et al. 2018). This migration has negative consequences for both the habitats, and human well-being (Rozzi 2013). For the native habitats, consequences cause a loss of ancestral human stewards or custodians of the land. For the displaced people, this migration causes a loss of everyday contact with their communities of co-inhabitants and diverse life habits. In the cities, displaced people frequently lose their autonomy and lack access to basic services, such as food, water, shelter, and sanitary conditions. They face extreme poverty conditions that are rapidly expanding in the marginal neighborhoods of metropolitan areas.

Regarding the *environment*, we can identify a combination of physical, technological, conceptual, and philosophical barriers that have driven global society’s dissociation from and indifference towards biological and cultural diversity (Rozzi 2013). Physical and technological barriers are associated with mediating technologies that create conditions in which urban consumers experience nature (and everyday resources such as food and water) indirectly as opposed to immediate experiences (with plants, rivers, and other ecosystems) (Poole 2015; 2018). Conceptual barriers are associated with the fact that 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. Today fifty-two percent of the world population speaks one of the following seven dominant languages: Mandarin, English, Hindi, Spanish, Russian, Arabic, and Bengali (Lewis 2009). These seven languages represent only a minimal fraction (0.1%) of the 6,909 languages that are still spoken around the globe (Maffi 2005). This linguistic homogenization drastically reduces the spectrum of concepts and worldviews with which biological and cultural diversity are perceived, understood, and valued by global society. Consequently, multiple forms of ecological knowledge and of environmental ethics are lost.



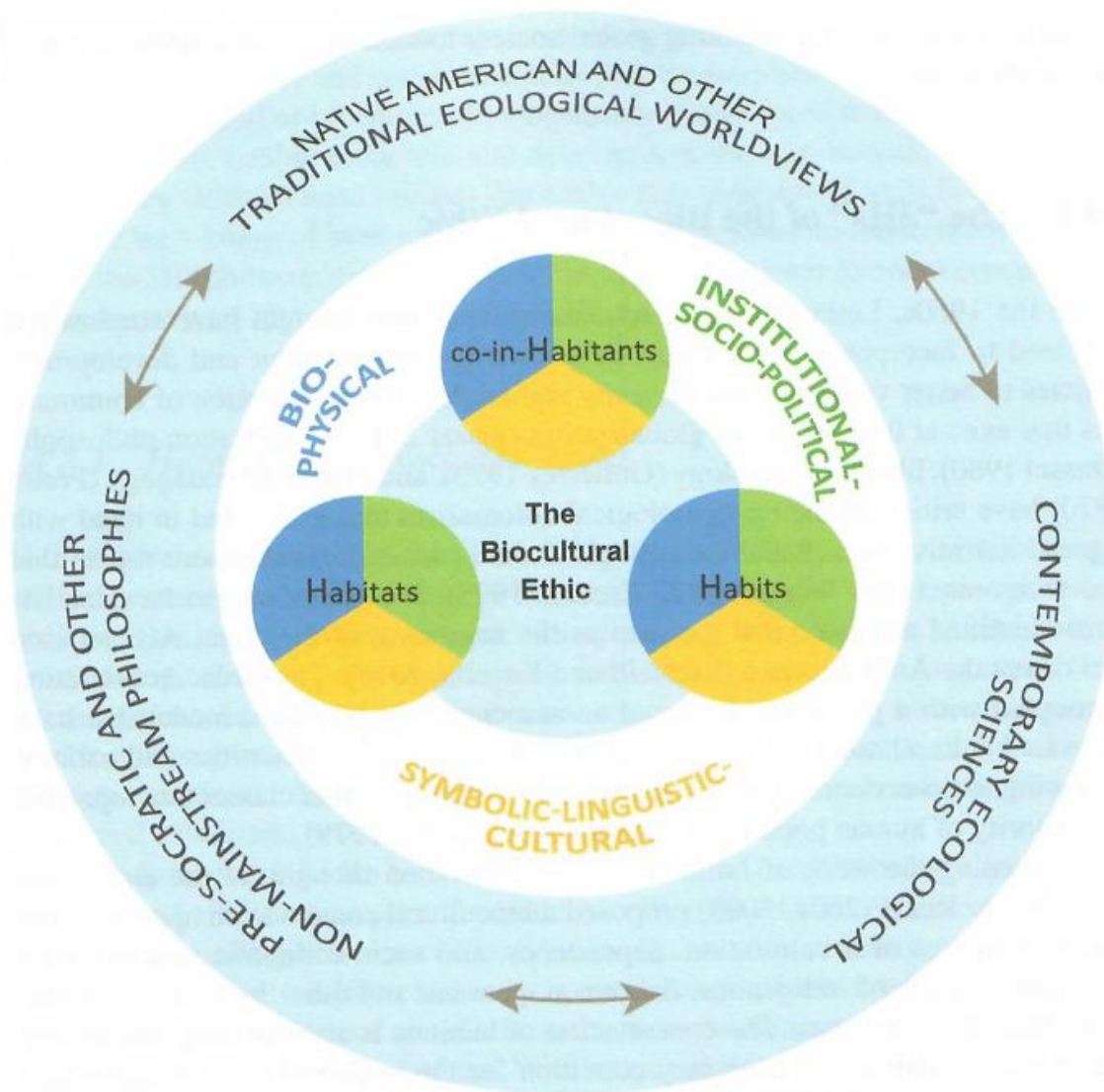
The lack of consideration for the ecological and cultural diversity, and their interrelationships in the heterogeneous regions of the planet, has driven processes of biocultural homogenization, which represents an overlooked dimension of the Global Changes, which drives the Anthropocene (Rozzi et al. 2018). Biocultural homogenization entails interwoven losses of native biological and cultural diversity at local, regional, and global scales. It is a driver and a product of complex and pervasive losses of biological and cultural diversity; however, it is not yet widely recognized to its full extent. The massive replacement of native biota and cultures by cosmopolitan species, languages, and cultures disrupts co-evolutionary interrelationships between local cultures and their habitats. A society exposed to globally homogeneously governed life habits is more likely to build globally homogeneous habitats. At the same time, globally homogeneous technological and urban habitats reinforce globally homogeneous life habits and mindsets. To recognize these positive, wicked feedbacks between cosmopolitan habits and habitats, and their consequences for human and non-human co-inhabitants, Rozzi (2001; 2012a) coined the term *biocultural homogenization*.

To counterbalance biocultural homogenization, Rozzi (2012a) developed the conceptual framework of the biocultural ethic that values the vital links between the diversity of life *habits* of distinct (human and other-than-human) *co-in-habitants* that share a common *habitat*. For ecologists the links between the “3Hs” (*Habitats, Habits, co-in-Habitants*) might seem obvious. However, today these links are being rapidly, and extensively, disrupted through policies and development models that neither consider nor value unique, diverse, local biota and cultures, which are consequently eliminated and replaced by a reduced and uniform set of biological species and cultural habits globally.

In this chapter, we propose that to address *Global Changes* in the *Contemporary Technological World* it is technically necessary and ethically imperative to acknowledge and revert the losses caused by biocultural homogenization. Policy decision at multiple scales, from global institutions, regional associations, local governments, decision makers, requires awareness and understanding of the significance of biological and cultural diversity and their interrelationships. To achieve this understanding, it is essential to broaden the “one-dimensional lens”<sup>2</sup> of neoliberalism. Toward this aim, and better addressing the challenges of Global Changes associated with biocultural homogenization, we present the 3Hs theoretical framework of the biocultural ethic. To counteract the prevalence of neoliberal “one-dimensional lenses,” the biocultural ethic introduces multi-dimensional lenses to perceive and value biological and cultural diversity (Fig. 14.1). This “philosophical lens” examines and values diverse forms of knowledge considering complementary biophysical, cultural, socio-political dimensions embedded in life habits linked to specific habitats and communities of co-inhabitants. First, to understand the 3Hs philosophical model of the biocultural ethic, we concisely define the meaning assigned to habitats, habits, and co-inhabitants. Then, we discuss the need of this philosophical and

<sup>2</sup>The one-dimensional man portrayed by Herbert Marcuse in the 1960s has come to dominate. As Marcuse (1991) argued, one-dimensional linear thinking is a form of social control, which oppresses diversity.





**Fig. 14.1** The biocultural ethic values communities of co-in-Habitants with their specific life Habits linked to specific Habitats (“3Hs”). The colors show that each of the “3Hs” has biophysical dimensions (blue), symbolic-linguistic-cultural dimensions (yellow), and institutional-socio-political, infrastructural-technological dimensions (green). The green color (a blending of blue and yellow) of the latter was chosen to indicate the need for carefully combining biophysical and symbolic-linguistic-cultural dimensions into policy, decision-making, and infrastructure designs. The external circle makes explicit the value of ecological worldviews of Native American and other non-Western cultures, of pre-Socratic and non-mainstream Western philosophies, and of contemporary sciences. The circular form of the figure and the bidirectional arrows illustrate the dynamic character of all these forms of ecological knowledge, and the active exchanges occurring among them in the context of a rapidly changing global society

biocultural approach for orienting global society toward more sustainable forms of co-inhabitation.

## 14.2 The “3Hs” of the Biocultural Ethic

Since the 1960s, Latin American schools of liberation thought have emphasized the need to incorporate local forms of knowledge in education and development policies to better value cultural diversity and enable the participation of communities that exist at the borders of globalization (Rozzi 2012b). Liberation philosophy (Dussel 1980), liberation theology (Gutiérrez 1973), and liberation pedagogy (Freire 1970) have criticized the epistemological colonialism that goes hand in hand with a grand narrative of a global technological and economic development model that was invigorated after World War II (Escobar 1995). Social-environmental scientists have identified this historical moment as the beginning of the Great Acceleration that drives the Anthropocene (McNeill and Engelke 2014). The Great Acceleration is coupled with a grand narrative and an associated development model that have generated cultural assimilation, economic dependency of communities and nations, a growing socio-economic-inequity, and exploitation of worker classes that represent the majority of human population (Cardoso and Faletto 1979).

Broadening the work of Latin American Liberation thought, at the end of the 20th century Rozzi (2001; 2003) proposed a biocultural conservation approach that linked processes of acculturation, dependency, and socio-economic inequity with the displacements of indigenous, fishermen, peasant, and other local communities from their native habitats. The conservation of habitats is scientifically understood and ethically valued as a necessary condition for the well-being and maintenance of cultural identity and associated life-habits of local communities. This approach provided the basis for framing the biocultural ethic that complemented the work developed earlier by Latin American liberation thinkers who focused on social and economic dimensions. To achieve equity and sustainability, Rozzi (2003, 2013) added that it is necessary to link the political, economic, and epistemological criticisms with an advocacy for the conservation of diverse and unique habitats and life habits evolved in each region.<sup>3</sup>

In this section, we concisely define the meaning assigned to *Habitats*, *Habits*, and *co-in-Habitants* with the goal of better understanding socio-ecological drivers of global changes and their ethical, political, and environmental implications. We propose that the “3Hs” conceptual framework of the biocultural ethic can be helpful to orient decision-making in environmental policies, development strategies, and

<sup>3</sup>This biocultural conservation approach is supported by the work of ecological economists, scientists, and historians of the global south, such as Martínez-Alier (2003), Shiva (1991), and Guba (1997) who have defended the value of local economies based on consuetudinary land tenure and conservation of biodiversity.



educational programs for biocultural conservation practices that are technically effective, as well as socially and environmentally just. Consequently, it can help reverting the prevailing trend of biocultural homogenization associated with colonizing epistemologies, life habits, economic and development models; instead, it can help to foster conservation of local habitats that enable the continuity of local life habits that favor the well-being of both human and other-than-human co-inhabitants. In other terms, the 3Hs philosophical framework has a heuristic power to orient conservation and restoration of biological and cultural diversity.

### 14.2.1 *Habitats and Protected Areas*

To conserve an habitat it is necessary to protect it from the abuse of unbalanced self-interests of particular agents that might cause degradation of ecosystems, biotic communities, or populations of particular species, as well as concomitant losses of local ecological knowledge, worldviews, practices, and vernacular languages. Care for the habitats is rooted in both traditional consuetudinary rights and contemporary civil legal frameworks that are framed differently in different countries. Care for the habitats, creation and implementation of protected areas have been also motivated by ethical values and practices (Callicott 1994).

A keystone thesis of the biocultural ethic is that the care for habitats is rooted in the origin of ethical concepts and practices in Western, Native American, and other cultures. Regarding Western civilization, the intimate relationship between ethics and protected areas has historical roots in the Greek word *ethos*, which in its archaic sense referred to the den of an animal, and later to the human home. *Ethos* is one of the Greek roots for the word ethics. With an eco-philosophical hermeneutic, Rozzi (2012a, 2018a) translated this ancestral meaning of ethics as a *protected habitat*. In the conceptual framework of the *biocultural ethic* the notion of *habitat* includes three complementary dimensions; changes in one dimension imply changes in the other ones. The three dimensions of the biocultural concept of habitat are the following.

- (1). *Biophysical* dimensions that are scaled-up from local ecosystems to the global *biosphere* (sensu Vladimir Vernadsky, see Huggett 1999; Wu 2013). The biophysical dimension concentrates most of the definitions offered by dictionaries for the concept of habitat, which is understood as “the natural place of growth or occurrence of a species; the locality in which a plant or animal naturally grows or lives” (OED 1980). In ecology, the concept of habitat is often characterized as the place where an organism or a community of organisms live, including all living and nonliving factors or conditions of the surrounding environment. A host organism inhabited by parasites is a habitat as much as a grove of trees is a terrestrial habitat or a small pond is an aquatic habitat (Allen and Hoekstra 2015).
- (2). *Cultural and symbolic-linguistic* dimensions that scale-up from vernacular languages to the global *logosphere*. According to Krauss (2007), the *logosphere*



is the planetary web of *logos* or words, symbols, languages, and narratives. Rozzi (2015a, b) interprets that the *logosphere* houses the sphere of thinking or intelligence (in Greek *noos*) that was defined by Vernadski as the *noosphere*. In 1926, he proposed that the *noosphere* is generated by the set of living beings endowed with intelligence and their interactions with the environment in which they live (Vernadsky 2007). In the 1970s, research about the interactions between language and the environment became active giving origin to the field of eco-linguistics (Haugen 1972; Fill and Mühlhauser 2001; Mühlhauser 2003; Bang et al. 2007). As Humberto Maturana has emphasized, humans inhabit languages, and we become who we are through “*linguaging*” (Maturana et al. 1995). *Language-habitat* is a core concept of eco-linguistics (Bang and Trampe 2014). On the one hand, the language-habitat concept enables an understanding of why biocultural conservation is threatened by the drastic current losses of vernacular languages (Krauss 1992; Maffi 2001; Batibo 2005). On the other hand, the language-habitat concept enables an understanding of a core concept that contemporary philosophy can offer to ecologists: plants, animals, rivers, and other components of biodiversity exist in the mind and symbolic language of people (including researchers) as much as they exist in the biophysical domain (Rozzi 2015b).

- (3). *Socio-political, institutional, and technological* dimensions scale up from local institutions to the global *technosphere* (sensu Zev Naveh and Arthur Lieberman 1990). In the twentieth century, the technosphere was defined by Naveh and Lieberman as that part of the physical environment affected through building or modification by humans. In the twenty-first century, ecologists Redman and Miller (2015) extended the meaning of the term technosphere to integrate infrastructure (physical and organizational) and technological systems. The constructed habitat or technosphere includes both physical structures (e.g., roads, bridges, water supply, sewers, or electrical networks) and organizational structures of services and institutions. Redman and Miller (2015, 270) argue that “those concerned with sustainability [...] must more robustly account for the centrality of technology in human-environment interactions, adjusting our conceptual frameworks to explore socio-eco-technological systems (SETS).”

All three dimensions of habitats—biophysical, linguistic, and technological including both physical and organizational infrastructure (e.g., institutions and policies)—have decisive influences on (and, in turn, are influenced by) life habits (Rozzi 2015a).

### 14.2.2 *Life Habits and Biocultural Diversity*

The notion of *habit* has become a lively topic of debate in various contemporary fields of theoretical and applied research, due to concern for the need to generate



new habits in relation to socio-political and socio-environmental issues, such as neo-racism or climate change (Bennet 2016). However, the meaning of habit is often limited to the behavioral or psychological spheres. Indeed, the definition offered by the *Oxford English Dictionary* (OED 1980) is constrained to “an established disposition or tendency to act in a certain way, especially one acquired by frequent repetition of the same act until it reaches almost or quite involuntarily, an established practice, custom, use.” This definition reduces the concept of habit to psychology and automatic behavior. This reductionist definition represents largely a legacy of the mind-body dualisms that prevailed in philosophy from Descartes to Kant (Plumwood 2002). In contrast, in the biocultural ethic conceptual framework the term *habit* has a broader connotation that considers its meanings through history and across disciplines.

The concept of habit is not limited to the behavioral or psychological spheres, but includes biological, sociological, neurological, epistemological, phenomenological, ontological, and moral dimensions (Sparrow and Hutchinson 2015). Regarding the latter, the term habit has an ethical connotation linked to the Aristotelian notions of virtue and living well. In his *Nicomachean Ethics*, Aristotle stated that “neither by nature... nor contrary to nature do virtues arise in us; rather we are adapted by nature to receive them, and are made perfect by habit” (2009, II, 1, 1103a 23–26). The process of character formation is based on the practice of habits, which are the foundation of Aristotle’s virtue ethics. To be fully human we rely on a “first nature” (biological) and a “second nature” (social, cultural) that is learned and practiced. In order to undertake biocultural conservation actions, this ethical dimension of habits helps us understand the socio-cultural roots of unsustainable lifestyles and to reorient them towards sustainable life habits.

In the twentieth century, French sociologist Pierre Bourdieu examined how life habits are learned through socialization processes that are influenced by family, social class, socioeconomic status, language, and culture. Bourdieu (1990, 56) defined this as the *habitus*: “Embodied history, internalized as a second nature.” Bourdieu critically observed that the *habitus* seemed innate, but that it is actually formed from schemes of perception and valuation of a social structure.

In the conceptual framework of the biocultural ethic, the meaning of the concept of *habit* is close to that of the Latin word *habitus*. Historically, *habitus* has encapsulated the intentional and intelligent dispositions that are part of practical reason (Crossley 2013), and Bourdieu’s work has clearly addressed its social conditions. However, as compared to the concept of *habitus*, the use of the term *habit* includes an additional ecological and evolutionary meaning (Odling-Smee et al. 2003; Laland et al. 2016). A *modus vivendi*, involving ways of life that are more complex than mere instincts, which allow the consideration of life habits of both human and other-than-human co-inhabitants. The sociological understanding of *habitus* combined with neo-Aristotelian schools of virtue ethics and new findings of ecological and ethological sciences give a broader biocultural meaning to the concept of habit. This biocultural meaning of habit has relevant implications for better understanding indirect drivers of global changes associated with human behavior, and for assessing the



consequences that specific life habits have for the oppression (or, alternatively, the well-being) of the majority of human and other-than-human co-inhabitants.

### 14.2.3 *Co-inhabitants and Companions*

Rozzi (2003, 2004) introduced the term *co-inhabitant* motivated by his fieldwork experiences in tropical and temperate forests of South America, where birds exhibit intentionality in their behaviors, including the care for their “family members.” These life habits take place in the same habitats that are inhabited by humans, who also take care for their family members. From this experience, emerged the meaning of being co-inhabitants; i.e., sharing the same habitat. Sharing the habitat implies an ecological-evolutionary process. Taking care of the habitat and the “family members” implies an ethical duty. Therefore, the concept of co-inhabitant has a double meaning: it is both descriptive and normative.

The term *co-inhabitant* that refers to sharing the habitat has an analogous meaning to the concept of companion that alludes to sharing bread (from Latin, *cum* = with; *panis* = bread). The understanding that our species *Homo sapiens* share the habitats with other species is implicit in the etymological origin of the word *human*, which derives from the Latin word *humus* that means soil. Complementary, in the origins of the Judeo-Christian tradition the name of the first human being is Adam, which derives from the Hebrew *adamah*, which also means *soil*. In Genesis, both the name and the material origin of the first human being are associated in with soil, with nature: “Then God formed man (*adam*) from the dust of the earth (*adamah*), breathed into his nostrils the breath of life and was the man a living being” (in Callicott 1994, 45). These ancient biocultural understandings found in the origins of Western civilization is corroborated today by contemporary biogeochemical sciences that demonstrate that the molecular constitution of human bodies has a chemical composition similar to humus or organic matter of the soil (Schlesinger and Bernhardt 2013).

The concept of co-inhabitant is not only consistent with early Western civilization concepts of humans and contemporary biogeochemical sciences but also with ecological worldviews of native peoples. For many Native American cultures, birds are seen as companions with whom habitat must be shared (Massardo and Rozzi 2004). In addition, in Native American stories there is often a sense of genealogical kinship as well. For some native cultures, such as the Koyukon in North America (Nelson 1983) or the Fuegian-Yahgans in South America (Rozzi et al. 2010), birds were humans in ancestral times. For other Native American cultures, such as the Ojibwa in North America (Callicott and Nelson 2004) and the Mapuche of South America (Rozzi 2004), human beings could be descendants of birds. In these indigenous worldviews, birds and humans share common ancestors; hence, birds and humans were considered as both co-inhabitants and “cousins,” an expression used by Charles Darwin in his *On the Origin of Species*. Indeed, Native American ecological knowledge and scientific Western knowledge converge in the notion of evolutionary kinship. The ethical implications of the notion of kinship implicit in



Darwin’s evolutionary theory were elaborated in the mid-20th century by Leopold (1949), who introduced the concept of “companions in the odyssey of evolution” to extend the domain of the community of moral subjects to include the totality of beings with which humans co-inhabit.

The notion of co-inhabitant has interrelated ethical and ontological implications, which are relevant to criticize the currently prevailing conceptual framework of ecosystem services (Naeem 2013). This perspective considers that human subjects administer goods and services provided by ecosystem objects and processes; consequently, the only subjects (active agents with their own interest) are humans (Rozzi 2015a). Under the perspectives of ecosystem services, biodiversity and ecosystems are viewed as passive objects without intentionality or interests. Hence, these objects are managed by a utilitarian ethics that supposes an ontological split between human-subjects and nature-objects. This ontological split has a long history in Western philosophy and underlies the anthropocentric concept of sustainable development envisioned by the Brundtland Commission report, *Our Common Future* (WCED 1987). Environmental philosopher Irene Klaver (2013, 93) has pointed out that “the dualism between subject and object has been pervasive, deeply imbedded in Western thought, and at the root of a variety of interlocking dualisms, such as activity (or agency) versus passivity, resonating in culture versus nature. A dualistic mindset comes with a value attribution, with an implied sense of superiority (culture, agency) versus inferiority (nature, passivity) and hence an implied legitimation for use, domination and exploitation.”

In contrast to utilitarian ethics, the concept of co-inhabitant considers all living beings as active subjects with their own interests (Rozzi 2013). As argued above, this statement is supported by concepts associated with the notion of co-inhabitant that have ancient roots in Western philosophy and contemporary sciences. Pre-Socratic philosophers and Aristotle considered that all living beings had souls (Lat. *anima*), which meant spirit and, in turn, spirit (Lat. *spiritus*) meant breathing (Rozzi 2015a). Contemporary sciences have demonstrated that *eukaryotes* (that include all multicellular organisms and one-celled organisms belonging to the kingdom Protista) use the same cellular respiration processes. The same set of biochemical reactions take place in the mitochondria of cells of protists, fungi, plants, and animals that require oxygen to convert the energy of nutrients into molecules of adenosine triphosphate (ATP) (Mazzarelli 1999).

Today’s scientific understanding of cellular respiration resonates with the assertions of Aristotle and of Native American people for whom all living creatures, domestic and wild, are perceived as having “spirit,” and must be respected (May 2017). Respect frames human interactions with plants and animals. They are not “mere natural resources” but rather co-inhabitants that participate in rituals, farming, husbandry practices, and everyday life (Mamani-Bernanbé 2015; May 2015; Rozzi 2015b). For some Native American cultures, such as the Kayapó in Amazonia, plants and animals are considered friends with whom humans engage as co-inhabitants in interrelated processes of production, exchange, and consumption (Zanotti 2018). In summary, based on conceptual foundations of Western civilization,



contemporary sciences, and Native American ecological worldviews, within the conceptual framework of the biocultural ethic, the word co-inhabitants acquires a broader meaning to emphasize three essential attributes of the diverse (human and other-than-human) beings that share a habitat. (1) Co-inhabitants are subjects not objects. (2) Co-inhabitants co-constitute their identities and their well-being by dwelling with other human and other-than-human beings. (3) Co-inhabitants share habitats that they co-structure through co-inhabitation relationships. They establish ecological relationships of complementarity and reciprocity that occur through exchanges of matter and energy. Therefore, the care and conservation of habitats is the condition of possibility for the existence and well-being of the diverse co-inhabitants. We propose a reconceptualization of the relationship between global society and the biosphere in terms of co-inhabitation. Co-inhabitation implies reciprocity. Based on this notion, a specific contribution of the co-inhabitation paradigm shift is the proposal to transform the *Nature Contributions to People* (NCP) framework currently used by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) (Pascual et al. 2017), by adding the reciprocal components of *People's Contribution to Nature* (Rozzi et al. In press).

### 14.3 Concluding Remarks

In this chapter, we have criticized the reduction of language and “naturalization” of economic growth mindsets and aims to bring back into global society (its culture, science, and policy) concepts that have been marginalized. We have presented the 3Hs model of the biocultural ethic to provide a novel conceptual lens to discuss the threats to local ecological knowledge (LEK), traditional ecological knowledge (TEK), linguistic diversity and the interwoven relationship this has to the loss of biological diversity (Maffi 2001; Persic and Martin 2008; Pretty et al. 2009; Rozzi 2012a). Unless explicitly identified, threats to cultural diversity and alternative forms of economies will remain unaddressed within sustainable development discourse (Agyeman 2005; Argumedo et al. 2011; Argumedo and Pimbert 2008; Berkes et al. 2000; Cocks 2010; Mühlhäusler 2001; Rozzi 2013). Consequently, it is necessary to adopt a biocultural prism that enables to make explicit this missing piece in the current articulation of prevailing sustainable development policies and practices (UNESCO 2010; Zent 2009; Poole 2018).

With the theoretical framework of the biocultural ethic, we aim to decolonize social mindsets dazzled by the paradigm of one-dimensional economic growth. Non-capitalist dimensions of human existence have been eliminated under the prevalence of this paradigm (Brand and Wissen 2013). The one-dimensional man portrayed by Herbert Marcuse in the 1960s has come to dominate. As Marcuse (1991) argued, consumerism is a form of social control. To transform the economic growth paradigm controlled by political, economic, and technological powers that drive major processes of global changes we maintain that it is necessary to change the prevailing



language with which the natural world is perceived and valued by global society (Rozzi 2015a).

To reorient unsustainable trends of global changes, we propose that it is indispensable to overcome the global mindset dominated by a one-dimensional instrumental way of thinking. Complementarily, it is indispensable to (re)incorporate a plethora of marginalized concepts, values, and ways of thinking and living (Rozzi 2018b). Reintegrating this multi-dimensionality into educational, political, and decision-making spheres could help to de-homogenize the mindsets and life habits of globalized society. A biocultural cascade effect triggered by changing the conceptual languages could, in turn, modify habits of thinking and acting (Rozzi 2018c).

In the 2010s, some scientists have pointed out the need to change the language to implement effective conservation programs and to address complex socio-environmental problems (Spash and Aslaksen 2015). They have warned about the shortcomings of an economic discourse that is being increasingly used by ecologists and conservation biologists who conceptualize biodiversity and ecosystems as goods and services that can be represented by monetary values in policy processes. Spash and Aslaksen (2015) caution that this narrow instrumentalist approach denies value pluralism and incommensurability, and call for re-establishing an ecological discourse in biodiversity and broader environmental policies.

The biocultural cascade effect proposed by Rozzi (2018c) aim to tackle the need of transforming the prevailing language of global society and associated unsustainable life habits into sustainable ones, which can favor conservation of native habitats and the well-being of co-inhabitants with whom we share these habitats. In the 1980s, the UN World Charter for Nature had already stated that: “Every form of life is unique, warranting respect regardless of its worth to man [sic], and, to accord other organisms such recognition, man must be guided by a moral code of action” (UN 1982, 2). Three decades later, the United Nations General Assembly passed a new Resolution entitled *Transforming Our World, the 2030 Agenda for Sustainable Development*, as “a plan of action for people, planet, and prosperity” (UNGA 2015, 1). This resolution launched the Sustainable Development Goals (SDG) to update goals by incorporating lessons learned from the Millennium Development Goals (MDG). The SDGs are an expansion of the original eight proposed within the larger framework of the Millennium Ecosystem Assessment (2003), and are intended to encapsulate the shortfalls for a more inclusive and sustainable future. However, the SDGs do not explicitly articulate the importance of local ecological knowledge and cultural diversity for sustainability as a high-level priority (Poole 2018). This absence represents a conceptual lacuna that must be addressed in order to recognize biocultural heritage within policies to address complex global changes. This is not just an academic exercise, but it is a crucial matter of life or death for myriads of co-inhabitants in all corners of the planet.

In summary, we have presented the biocultural ethic’s 3Hs conceptual framework to offer a heuristic model that can be helpful in three fronts. First, to understand better the complexities of multidimensional and multi-scale processes involved in global changes. Second, to design policies that can integrate better the ethical, political, and environmental dimensions of the contemporary technological world. Third,



to assist decision-making processes in assessing the consequences that development projects might have for the conservation or destruction of habitats, life habits, and welfare of co-inhabitants. In this way, the 3Hs philosophical framework of the biocultural ethic can contribute to orient global society toward sustainable forms of co-inhabitation amidst the rapidly changing socio-environmental scenarios that characterize the Anthropocene.

**Acknowledgements** We acknowledge the support of the Institute of Ecology and Biodiversity (IEB) through the grant AFB170008 (CONICYT, Chile). This chapter is a contribution to the Sub-Antarctic Biocultural Conservation Program coordinated by IEB and the University of Magallanes in Chile, and by the University of North Texas in the US.

## References

- Agyeman J (2005) Sustainable communities and the challenge of environmental justice. New York University Press, New York
- Allen TFH, Hoekstra TW (2015) Toward a unified ecology. Columbia University Press, New York
- Argumedo A, Pimbert M (2008) Protecting farmers' rights with indigenous biocultural heritage territories: the experience of the Potato Park. Available via: IIED/Asociacion ANDES. <http://pubs.iied.org/pdfs/G03072.pdf>. Accessed 25 Sept 2018
- Argumedo A, Swiderska K, Pimbert M, Song Y, Pant R (2011) Implementing farmers' rights under the FAO International Treaty on PGRFA: the need for a broad approach based on biocultural heritage. Paper presented at the 4th Governing Body of the International Treaty on PGRFA, Bali, 14–18 March 2011. Available via: [http://cmsdata.iucn.org/downloads/farmers\\_rights\\_paper\\_bali\\_draft5.pdf](http://cmsdata.iucn.org/downloads/farmers_rights_paper_bali_draft5.pdf). Accessed 25 Sept 2018
- Aristotle (2009) The Nicomachean ethics (Trans: Ross D). University Press, Oxford
- Bang JC, Døør J, Steffensen SV, Nash J (2007) Language, ecology, and society: a dialectical approach. Continuum, London
- Bang JC, Trampe W (2014) Aspects of an ecological theory of language. *Lang Sci* 41:81–92
- Batibo HM (2005) Language decline and death in Africa: causes, consequences and challenges. Multilingual Matters, Clevedon
- Bennett T (2016) Mind the gap: toward a political history of habit. *Comparatist* 40:28–55
- Berkes F, Folke C, Colding J (2000) Linking social and ecological systems: management practices and social mechanisms for building resilience. Cambridge University Press, Cambridge
- Borras SM Jr, Franco JC, Gómez S, Kay C, Spoor M (2012) Land grabbing in Latin America and the Caribbean. *J Peas Stud* 39:845–872
- Borras SM, Hall R, Scoones I, White B, Wolford W (2011) Towards a better understanding of global land grabbing. *J Peas Stud* 38:209–216
- Bourdieu P (1990) The logic of practice (Trans: Nice R). Polity, Cambridge
- Brand U, Wissen M (2013) Crisis and continuity of capitalist society-nature relationships: the imperial mode of living and the limits to environmental governance. *Rev Int Polit Econ* 20(4):687–711
- Callicott JB (1994) Earth's insights: a multicultural survey of ecological ethics from the Mediterranean Basin to the Australian outback. University of California Press, Berkeley
- Callicott JB, Nelson MP (2004) American Indian environmental ethics: an Ojibwa case study. Pearson, New York
- Cardoso FH, Faletto E (1979) Dependency and development in latin America. University of California Press, Berkeley
- Cocks M (2010) What is biocultural diversity? A theoretical review. In: Bates DG, Tucker J (eds) Human ecology: contemporary research and practice. Springer, Boston, pp 67–77



- Crossley N (2013) Habit and habitus. *Body & Society* 19(2–3):136–161
- Dussel E (1980) *Liberation philosophy*. Orbis Books, New York
- Escobar A (1995) *Encountering development: the making and unmaking of the third world*. Princeton University Press, Princeton
- Fill A, Mühlhäusler P (2001) *The ecolinguistics reader*. Continuum, London
- Flavin C (2007) Preface. In: Starke L (ed) *State of the world 2007: our urban future*. Worldwatch Institute, Washington, pp xxiii–xxv
- Freire P (1970) *Pedagogy of the oppressed*. Continuum, New York
- Guha R (1997) The authoritarian biologist and the arrogance of anti-humanism: wildlife conservation in the third world. *Ecologist* 27:14–20
- Gutiérrez G (1973) *A theology of liberation: history, politics, and salvation*. Orbis Books, New York
- Haugen E (1972) *The ecology of language*. Stanford University Press, Stanford
- Huggett RJ (1999) Ecosphere, biosphere, or gaia? What to call the global ecosystem. *Glob Ecol Biogeogr* 8:425–431
- Klaver IJ (2013) Environment imagination situation. In: Rozzi R, Pickett STA, Palmer C, Armesto JJ, Callicott JB (eds) *Linking ecology and ethics for a changing world: values, philosophy, and action*. Springer, Dordrecht, pp 85–105
- Krauss M (1992) The world's language in crisis. *Language* 68:4–10
- Krauss M (2007) Mass language extinction and documentation: the race against time. In: Miyaoka O, Sakiyama O, Krauss ME (eds) *The vanishing languages of the pacific rim*. Oxford University Press, New York, pp 3–24
- Laland KN, Matthews B, Feldman M (2016) An introduction to Niche construction theory. *Evolut Ecol* 30(2):191–202
- Lenzner B, Essl F, Seebens H (2018) The changing role of Europe in past and future alien species displacement. In: Rozzi R, May Jr RH, Stuart Chapin III F, Massardo F, Gavin MC, et al (eds) *From biocultural homogenization to biocultural conservation*. Springer, Dordrecht. In press
- Leopold A (1949) *A sand county almanac and sketches here and there*. Oxford University Press, New York
- Lewis PM (2009) *Ethnologue: languages of the world*. SIL International, Dallas
- Lewis SL, Maslin MA (2015) Defining the Anthropocene. *Nature* 519:171–180
- Maffi L (2001) On the interdependence of biological and cultural diversity. In: Maffi L (ed) *On biocultural diversity: linking language, knowledge, and the environment*. Smithsonian Institution Press, Washington, pp 1–50
- Maffi L (2005) Linguistic, cultural, and biological diversity. *Ann Rev Anthropol* 34:599–617
- Maffi L (2007) Biocultural Diversity and Sustainability. In: J Pretty, AS Ball, T Benton, JS Guinant, DR Lee, D Orr, MJ Pfeiffer, H Ward (eds) *The SAGE Handbook of Environment and Society*. Sage Publications, London, 267–278
- Makki F (2018) The political ecology of land grabs in Ethiopia. In: Rozzi R, May Jr RH, Stuart Chapin III F, Massardo F, Gavin MC, et al (eds) *From biocultural homogenization to biocultural conservation*. Springer, Dordrecht. In press
- Mamani-Bernabé V (2015) Spirituality and the Pachamama in the Andean Aymara worldview. In: *Linking ecology and ethics for a changing world: values, philosophy, and action*, ed. Rozzi R, Pickett STA, Palmer C, Armesto JJ, Callicott JB. Springer, Dordrecht, pp 65–76
- Marcuse H (1991) *One-dimensional man: studies in ideology of advanced industrial society*. Routledge, London
- Martinez-Alier J (2003) *The environmentalism of the poor: a study of ecological conflicts and valuation*. Edward Elgar Publishing, Northampton
- Massardo F, Rozzi R (2004) Etno-ornitología yagán y lafkenche en los bosques templados de Sudamérica austral. *Ornitol Neotrop* 15:395–407
- Maturana H, Mpodozis J, Letelier JC (1995) Brain, language, and the origin of human mental functions. *Biol Res* 28:15–26
- May RH Jr (2017) Pachasophy: landscape ethics in the Central Andes mountains of South America. *Environ Eth* 39:301–319



- May Jr RH (2013) Andean Llamas and Earth Stewardship. In: Rozzi R, Pickett STA, Palmer C, Armesto JJ, Callicott JB (eds) *Linking ecology and ethics for a changing world: values, philosophy, and action*. Springer, Dordrecht, pp 77–86
- Mazzarello P (1999) A unifying concept: the history of cell theory. *Nat Cell Biol* 1(1):E13–E15
- McNeill JR, Engelke P (2014) *The great acceleration: an environmental history of the anthropocene since 1945*. Harvard University Press, Cambridge
- Millennium Ecosystem Assessment (2003) *Ecosystems and human well-being: a framework for assessment*. Island Press, Washington
- Mühlhäusler P (2001) Ecolinguistic, linguistic diversity and ecological diversity. In: Maffi L (ed) *On biocultural diversity: linking language, knowledge, and the environment*. Smithsonian Institution Press, Washington, pp 133–144
- Mühlhäusler P (2003) *Language environment, environment of language: a course in ecolinguistics*. Battlebridge, London
- Naeem S (2013) Ecosystem services: is a planet servicing one species likely to function? In: Rozzi R, Pickett STA, Palmer C, Armesto JJ, Callicott JB (eds) *Linking ecology and ethics for a changing world: values, philosophy, and action*. Springer, Dordrecht, pp 303–321
- Naveh Z, Lieberman AS (1990) *Landscape ecology*. Springer, New York
- Nelson RK (1983) *Make prayers to the raven. A Koyukon view of the northern forest*. University of Chicago Press, Chicago
- Odling-Smee FJ, Laland KN, Feldman MW (2003) *Niche construction: the neglected process in evolution*. Princeton University Press, Princeton
- OED (1980) *Oxford English dictionary*. Oxford University Press, New York
- Pascual U, Balvanera P, Díaz S, Pataki G, Roth E, Stenseke M et al (2017) Valuing nature's contributions to people: the IPBES approach. *Curr Opin Environ Sustain* 26:7–16
- Persic A, Martin G (2008) Links between biological and cultural diversity: report of the international workshop, 26–28 September 2007. Available via: UNESCO HQ Paris. <http://unesdoc.unesco.org/images/0015/001592/1592551>. Accessed 1 Oct 2018
- Plumwood V (2002) *Environmental culture: the ecological crisis of reason*. Routledge, London
- Poole AK (2015) *Urban sustainability and the extinction of experience: acknowledging drivers of biocultural loss for socio-ecological well-being*. Dissertation, University of North Texas
- Poole AK (2018) Sustainable development goals and the biocultural heritage Lacuna: where is goal number 18? In: Rozzi R, May Jr RH, Stuart Chapin III F, Massardo F, Gavin MC, et al (eds) *From biocultural homogenization to biocultural conservation*. Springer, Dordrecht. In press
- Pretty J, Adams B, Berkes F, de Athayde SF, Dudley N, Hunn E et al (2009) The intersections of biological diversity and cultural diversity: towards integration. *Conserv Soc* 7(2):100–112
- Redman CL, Miller TR (2015) The technosphere and earth stewardship. In: Rozzi R, Pickett STA, Palmer C, Armesto JJ, Callicott JB (eds) *Linking ecology and ethics for a changing world: values, philosophy, and action*. Springer, Dordrecht, pp 269–279
- Rozzi R (2001) Éticas ambientales latinoamericanas: raíces y ramas. In: Primack R, Rozzi R, Feinsinger P, Dirzo R, Massardo F (eds) *Fundamentos de conservación biológica: perspectivas Latinoamericanas*. Fondo de Cultura Económica, México, pp 311–362
- Rozzi R (2003) Biodiversity and social wellbeing in South America. *Encyclopedia of life support systems (EOLSS)*. UNESCO-EOLSS. Available via: [www.eolss.net](http://www.eolss.net). Accessed 1 Oct 2018
- Rozzi R (2004) Implicaciones éticas de narrativas yaganes y mapuches sobre las aves de los bosques templados de Sudamérica austral. *Ornitol Neotrop* 15:435–444
- Rozzi R (2012a) Biocultural ethics: The vital links between the inhabitants, their habits and regional habitats. *Environ Eth* 34:27–50
- Rozzi R (2012b) South American environmental philosophy: ancestral amerindian roots and emergent academic branches. *Environ Eth* 34:343–365
- Rozzi R (2013) Biocultural ethics: from biocultural homogenization toward biocultural conservation. In: Rozzi R, Pickett STA, Palmer C, Armesto JJ, Callicott JB (eds) *Linking ecology and ethics for a changing world: values, philosophy, and action*. Springer, Dordrecht, 113–136



- Rozzi R (2015a) Implications of the biocultural ethic for earth stewardship. In: Rozzi R, Stuart Chapin F, Callicott JB, Pickett STA, Power ME, Armesto JJ, May Jr RH (eds) *Earth stewardship: linking ecology and ethics in theory and practice*. Springer, Dordrecht, pp 113–136
- Rozzi R (2015b). *Earth Stewardship and the biocultural ethic: latin American perspectives*. In: Rozzi R, Stuart Chapin F, Callicott JB, Pickett STA, Power ME, Armesto JJ, May Jr RH (eds) *Earth stewardship: linking ecology and ethics in theory and practice*. Springer, Dordrecht, pp 87–112
- Rozzi R, May RH Jr, Chapin III FS, Massardo F, Gavin MC, Klaver I, Pauchard A, Nuñez MA, Simberloff D (eds) (2018). *From biocultural homogenization to biocultural conservation*. Ecology and ethics series, vol 3. Springer International Publishing
- Rozzi R (2018a) Áreas protegidas y ética biocultural: reconectando a la sociedad global con diversos hábitats, co-habitantes y hábitos de vida sustentable. In: Cerda C, Silva E, Briceño C, Promis Á (eds) *Dimensión Humana, Conservación y Gestión de Áreas Protegidas*. Santiago (Chile), Ocho Libros. In press
- Rozzi R (2018b). Biocultural conservation and biocultural ethics. In: Rozzi R, May Jr RH, Stuart Chapin III F, Massardo F, Gavin MC, et al (eds) *From biocultural homogenization to biocultural conservation*. Springer, Dordrecht. In press
- Rozzi R (2018c) Biocultural homogenization: a wicked problem in the anthropocene. In: Rozzi R, May Jr RH, Stuart Chapin III F, Massardo F, Gavin MC, et al (eds) *From Biocultural Homogenization to Biocultural Conservation*. Springer, Dordrecht. In press
- Rozzi R, May Jr RH, Stuart Chapin III F, Massardo F, Gavin MC, et al. *From biocultural homogenization to biocultural conservation*. Springer, Dordrecht. In press
- Rozzi R, Massardo F, Anderson CB, McGehee S, Clark G, Egli Guillermo et al (2010) *Multi-ethnic bird guide of the sub-Antarctic forests of South America*. UNT Press, Denton (Texas) and Punta Arenas (Chile)
- Schlesinger WH, Bernhardt ES (2013) *Biogeochemistry: an analysis of global change*. Academic Press, New York
- Shiva V (1991) *Ecology and the politics of survival: conflicts over natural resources in India*. Sage, Newbury Park
- Sparrow T, Hutchinson A (2015) *A history of habit: from Aristotle to Bourdieu*. Lexington Books, Lanham
- Spash CL, Aslaksen I (2015) Re-establishing an ecological discourse in the policy debate over how to value ecosystems and biodiversity. *J Environ Manage* 159:245–253
- Steffen W, Persson Å, Deutsch L, Zalasiewicz J, Williams M, Richardson K, Crumley C, Crutzen P, Folke C, Gordon L, Molina M, Ramanathan V, Rockström J, Scheffer M, Schellnhuber HJ, Svedin U (2001) The Anthropocene: from global change to planetary stewardship. *Ambio* 40(7): 739–761
- Will S, Persson ÅH, Deutsch L, Zalasiewicz JA, Williams M, Richardson K, Crumley CL et al (2011) The Anthropocene: from global change to planetary stewardship. *Ambio* 40:739–761
- UN (1982) *United Nations world charter for nature*. United Nations, New York
- UNESCO (2010) *2010 declaration of bio-cultural diversity*. In: *The international conference on cultural and biological diversity for development*, Montreal. Available via: <http://www.unesco.org/mab/doc/iyb/Declaration.pdf>. Accessed 7 June 2015
- UNGA (2015) *United Nations general assembly resolution 70/1, transforming our world: the 2030 agenda for sustainable development*, A/79/L.1. Available via: [undocs.org/A/RES/70/1](http://undocs.org/A/RES/70/1). Accessed October 1 2018
- Vernadsky VI (2007) *La Biosfera y la Noosfera*. Ediciones IVIC, Caracas
- Waters CN, Zalasiewicz J, Summerhayes C, Barnosky AD, Poirier C, Gałuszka A et al (2016) The Anthropocene is functionally and stratigraphically distinct from the holocene. *Science* 351:137
- World Commission on Environment and Development [WCED] (1987) *Our common future*. Oxford University Press, Oxford
- Wu J (2013) Hierarchy theory: an overview. In: Rozzi R, Pickett STA, Palmer C, Armesto JJ, Callicott JB (eds) *Linking ecology and ethics for a changing world: values, philosophy, and action*. Springer, Dordrecht, pp 281–302



- Zalasiewicz J, Waters CN, Williams M, Barnosky AD, Cearreta A, Crutzen P et al (2015) When did the Anthropocene begin? A mid-twentieth century boundary level is stratigraphically optimal. *Q Int* 383:196–203
- Zanotti L (2018) Biocultural approaches to conservation: water sovereignty in the Kayapó lands. In: Rozzi R, May Jr RH, Stuart Chapin III F, Massardo F, Gavin MC, et al From biocultural homogenization to biocultural conservation. Springer, Dordrecht. In press
- Zent S (2009) Traditional ecological knowledge (TEK) and biocultural diversity: a close-up look at linkages, delearning trends, and changing patterns of transmission. In: Bates P, Chiba M, Kube S, Nakashima D (eds) Learning and knowing in indigenous societies today. UNESCO, Paris, pp 39–58