

Ecology and Ethics 3

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From Biocultural Homogenization to Biocultural Conservation

 Springer

Ecology and Ethics

Volume 3

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Ecology and Ethics

This series is devoted to continuing research at the interfaces of ecology and ethics (embedded in the multiple fields of philosophy and ecology) to broaden our conceptual and practical frameworks in this transdisciplinary field. Confronted with global environmental change, the academic community still labors under a tradition of strong disciplinary dissociation that hinders the integration of ecological understanding and ethical values to comprehensively address the complexities of current socio-ecological problems. During the 1990s and 2000s, a transdisciplinary integration of ecology with social disciplines, especially economics, has been institutionalized via interdisciplinary societies, research programs, and mainstream journals. Work at this interface has produced novel techniques and protocols for assessing monetary values of biodiversity and ecosystem services, as illustrated by the Millennium Ecosystem Assessment. At the beginning of the 2010s, however, an equivalent integration between ecology and philosophy still remains elusive. This series undertakes the task to develop crucial theoretical and practical linkages between ecology and ethics through interdisciplinary, international, collaborative teamwork. It aims to establish a new forum and research platform to work on this vital, but until now insufficiently researched intersection between the descriptive and normative domains. The scope of this series is to facilitate the exploration of sustainable and just ways of co-inhabitation among diverse humans, and among humans and other-than-human co-inhabitants with whom we share our heterogeneous planet. It will address topics integrating the multiple fields of philosophy and ecology such as biocultural homogenization, Planetary or Earth Stewardship.

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Foreword

The challenging issue of global biocultural homogenization is comprehensively presented and discussed in this important book – and its arrival is none too soon! Biocultural homogenization, as defined by Rozzi et al. in the first chapter of the book, “entails the interwoven losses of native biological and cultural diversity at local, regional, and global scales.” This issue of biocultural homogenization is neither widely understood nor is its importance adequately appreciated even while it is occurring at an accelerating rate. This book will be an important aid in increasing recognition of the issue and its importance.

Homogenization is one outcome of an ever-increasing emphasis on the goal of economic efficiency, albeit it is a goal that is generally very narrowly defined. This goal of efficiency drives societies to move toward approaches focused upon production of singular outcomes, such as of food or fiber, without regard to the consequences to nature or to local cultures. Furthermore, these days the efforts toward economically efficient production of commodities are organized so as to primarily benefit global capital markets. This leads to such outcomes as the replacement (indeed, destruction) of family farms by corporate enterprises, all in the guise of economic efficiency. Of course, in turn this leads to practices which frequently have very negative effects on native biological diversity and local cultures.

This homogenization in pursuit of efficiency represents incredible threats to native biological and cultural diversity, if we truly care about such things. Homogenization is about simplification and standardization in many forms whereas nature and culture are about complexity and diversity. Approaches that incorporate complexity and diversity are not as efficient in the pursuit of many singular goals, such as production of food and fiber. However, approaches that conserve complexity and diversity are approaches that achieve multiple rather than singular objectives with their activities, reduce risks from both natural and social upheavals, and increase future societal options.

I would venture that there are powerful, fundamentally maleficent forces that specifically do not value diversity and do not wish to see it conserved. Do global capital markets really see value in diversity, other than a diversity of portfolios? Do global corporations see value in local solutions, local markets? Is there a wide

appreciation that the pursuit of efficiency, of homogenization, can lead to dysfunctional outcomes for global societies? For example, is there real concern in the United States for improving the opportunities and conditions of the diversity represented by rural America? I worry a great deal about the answers to such questions as these.

Forests are the ecosystems that I am most familiar with, and they offer great examples of some of the challenges that are faced as we attempt to deal with the issue of biocultural homogenization. There has been a global movement toward the creation and management of plantations of exotic tree species in pursuit of efficient production of wood fiber, much of this in the southern hemisphere. In the last several decades, this movement has been driven by global capital markets that invest in wood production as yet another means of seeking high returns on capital. The emphasis on capital return has put an economic cap on the already highly agronomic approaches associated with plantation forestry. The collective consequences have been what I call fiber farms, which involve practices that ignore other services and goods that are provided by forest ecosystems as well as the stability of local communities and viability of other forest landownerships. The only environmental constraints on such practices are those that are imposed by legal authorities present in the regions where such plantations are grown. Usually the harvested wood goes to the global market that is willing to pay the most for it and not to a local wood processing facility, which might result in greater economic benefits for local communities. Forest landowners who wish to manage for a diversity of values are challenged because they must find markets and compete in a global wood products economy dominated by the fiber farms.

This highly simplified, homogenized approach to wood production finds support in many quarters, including a globalized economy and history, and there are many similarities here between forestry and agriculture and fisheries. I have already talked about how a capital-dominated global economy favors homogenization and the marginalization of other forest values, except where governmental authorities insist otherwise. The dominant focus of the forestry profession on wood production as the most important use of forestland has been largely congruent with the emphasis on homogenization and efficiency in pursuit of a singular outcome.¹ Local communities and governments are advised that the homogenized approach is in their best economic interest and sometimes told that this is the only real way to do sustainable forestry. (The same is presented regarding corporate agriculture and fish farms.) Forestry as a profession has failed to even conceive, let alone demonstrate to society, credible alternatives to intensive plantation management based on clearcutting and even-aged management.² The foresters have been abetted by the community of academic conservation biologists who argue that native biodiversity can only be conserved in preserves – areas that are set aside from human societies (as if such a

¹Franklin, J. F., K. N. Johnson, and D. L. Johnson 2018. *Ecological forest management*. 646 p. Long Grove, IL, USA: Waveland Press.

²Bennett, Brett. 2015. *Plantations and protected areas. A global history of forest management*. 201 p. Cambridge, MA, USA: MIT Press.

thing was possible in the twenty-first century!). Biodiversity will not be preserved primarily by separating it from humankind but, rather, must be a part of conserved bioculture.

This book is an important contribution to the dialogue and hard work that is ultimately required to conserve as much as we can of diverse bioculture. The future of native biodiversity and local human societies are linked and face the same array of challenges. Many ideas, concepts, and examples are laid down in this volume that can move this important work forward. We are talking here about nothing less than the future of humankind – is it to be a homogenized future or one that nurtures diversity and the richness and resilience that it brings?

Let us all get on with it!

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Chapter 1

From Biocultural Homogenization to Biocultural Conservation: A Conceptual Framework to Reorient Society Toward Sustainability of Life



Ricardo Rozzi, Roy H. May Jr., F. Stuart Chapin III, Francisca Massardo, Michael C. Gavin, Irene J. Klaver, Aníbal Pauchard, Martín A. Nuñez, and Daniel Simberloff

Abstract 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. In this book we show how the processes of biological and cultural homogenization are intricately interrelated. A guiding theme is the conceptual framework of the biocultural ethic and its “3Hs” model, which facilitates understanding how some life habits that are being global-

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ized can lead to homogeneous habitats with detrimental consequences for many human and other-than-human co-inhabitants. The 3Hs conceptual framework enables a visualization of the interrelations between the homogenization of habits and habitats and the consequences it has for the well-being or the displacement of human and other-than-human co-inhabitants. In this way, it can inform and provide insights for decision-making in environmental policies, development, and educational programs, in order to foster processes of biocultural conservation and avoid pressing social and environmental injustices conveyed by current processes of biocultural homogenization.

Keywords Biocultural ethics · Biotic homogenization · Environmental justice · Land grabbing · Sustainability

1.1 Introduction

Biocultural homogenization is a wicked problem of the Anthropocene. It involves complex interdependencies, and, despite being pervasive, it is not yet widely recognized as such. *Homogenization* means the generation of sameness. The word combines the Greek terms *homos* (ὁμός) and *genesis* (γένεσις), which mean “same” and “creation,” respectively. *Biocultural* indicates a combination of biological and cultural factors. During the past three decades, biotic homogenization has been investigated by ecologists (McKinney and Lockwood 1999; Simberloff and von Holle 1999; Olden and Rooney 2006), while cultural homogenization has been researched by social scientists or humanists (Schaedel 1979; Petitat 1987; Quijano 2000; Rizvi and Lingard 2000). Biocultural homogenization interrelates these two processes (Rozzi 2012).

The process of biocultural homogenization entails simultaneous and interlinked losses of native biological and cultural diversity at local, regional, and global scales (Rozzi 2013). The massive replacement of native biota and cultures by cosmopoli-

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tan species, languages, and cultures disrupts coevolutionary interrelationships between local cultures and their habitats. We argue that a person who is mainly exposed to globally homogeneous habits is more likely to build globally homogeneous habitats; at the same time, globally homogeneous urban and rural habitats reinforce globally homogeneous life habits and mindsets. To recognize these positive and wicked feedbacks between cosmopolitan habits and habitats, and their consequences for human and nonhuman co-inhabitants, Ricardo Rozzi (2001, 2012) coined the term *biocultural homogenization*.

This book was initially conceived as an elaboration of the chapter “Biocultural Ethics: From Biocultural Homogenization to Biocultural Conservation” published by Rozzi in the first volume of the *Ecology & Ethics* series, *Linking Ecology and Ethics for a Changing World: Values, Philosophy, and Action* (Rozzi et al. 2013). Now, in this third volume, we interrelate the processes of biological and cultural homogenization by using the conceptual framework of the biocultural ethic and its “3Hs” model (Rozzi 2013). On the one hand, the 3Hs model facilitates the visualization of, and understanding about, how a *habit* (e.g., focusing on monospecific plantations or damming waterways) can lead to homogeneous *habitats* (e.g., monocultures or infrastructure such as dams or aqueducts) with detrimental consequences for many human and other-than-human *co-inhabitants*. On the other hand, as Irene Klaver (2018) emphasizes in her chapter, the 3Hs focus enables critical analyses of such homogenizing habits and can help reorient them toward habits that could instead promote processes of biocultural conservation.

This book introduces novel concepts, methods, and case studies to tackle complex processes of biocultural homogenization that permeate the Anthropocene but that have not yet been analyzed in this perspective. Our main goal is to explore and suggest conceptual and practical avenues for transitions from biocultural homogenization toward biocultural conservation. In 2014, Aníbal Pauchard, Martín Nuñez, Daniel Simberloff, and Rozzi met at the international course “Trends in Ecology of Plant Invasions” in the Andes Cordillera of Chile. We realized that biocultural homogenization incorporates three key additions to the more familiar and better documented process of biotic homogenization.

First, biocultural homogenization broadens the expression “a few winners replacing many losers” coined by Michael McKinney and Julie Lockwood (1999) beyond the scope of biological diversity toward cultural and socioeconomic diversity (Rozzi 2012). The latter includes a plethora of local communities with their idiosyncratic languages and worldviews. These cultural traditions are embedded in unique life habits coupled with specific habitats. These local communities influence, and are influenced by, biocultural landscapes inhabited by a diversity of living beings with whom human communities share their material lives as well as their rituals and symbolic lives. Hence, the replacement of many local cultures and their languages by a few widespread languages and global life habits promotes not only large-scale cultural homogenization but also biocultural homogenization.

Second, humans are both the direct and indirect drivers of biocultural homogenization. This contrasts with the case of invasive exotic species, which have become the direct drivers of habitat transformations and reduction of communities of native co-inhabitants. For example, in Part II of our *Biocultural Homogenization* book, Crego et al. (2018) show how today in South American Patagonia North American

beavers are transforming habitats by reducing the native forest cover and North American minks are transforming the communities of co-inhabitants by devastating populations of endemic bird species. The original cause for this process was the introduction of beavers and minks for a particular practice or habit: fur trade. However, today fur trade has disappeared, and these alien mammals have become invasive in most Patagonian habitats. In the case of biocultural homogenization, most practices involve active, although not always intentional, participation by human agents; hence, the ultimate solution would depend on the disposition to change life habits.

Third, life habits are shaped by a wide variety of factors, some of which are internal to the individual and many of which are influenced by the complex and dynamic social-economic-ecological systems in which all individuals live. Reorienting life habits requires negotiation among different stakeholders in challenging scenarios of economic and political power at local, national, and global scales, including large-scale land acquisitions. Actors external to local communities include, among others, both large preservationist organizations and multinational corporations that displace local communities. As one example, in his chapter analyzing processes of biocultural homogenization in Ethiopia, Fouad Makki (2018) criticizes the privatization of nomadic pastoralists and peasant land and village commons, which is presented today by global discourses as the inescapable prerequisite for bringing the benefits of the new green revolution to Africa.

To broaden the spectrum of perspectives on biocultural homogenization and to address pressing global and local socio-environmental problems from standpoints of different disciplines and regions of the world, Rozzi invited environmental philosopher Irene Klaver, conservation biologist Francisca Massardo, liberation theologian Roy May, ecosystem ecologist Terry Chapin, and biocultural conservation scientist Michael Gavin to join the editorial team. Together we summoned 46 contributors from Africa, Asia, Europe, and North and South America, who provide a balanced set of viewpoints from the Global South and North. To facilitate the incorporation of these biocultural viewpoints into research, policy, and educational domains, we have organized the book into three complementary parts: (I) Biocultural Homogenization, (II) Biotic Homogenization, and (III) Biocultural Conservation.

1.2 Part I: Biocultural Homogenization

In Part I, we aim to show how tackling biocultural homogenization requires non-linear thinking. The systemic, dynamic, and contextual model of the 3Hs of the biocultural ethic (sensu Rozzi 2013) enables an understanding of the interdependencies among habitats, life habits, and communities of co-inhabitants, which helps to identify opportunities for transitioning from biocultural homogenization to conservation. Tipping points exist in decision-making processes of socio-environmental, economic, and educational policies and actions. These processes tend either to favor conservation or restoration of native habitats and associated life habits of local

human communities and biota or, on the contrary, to cause their disappearance and replacement by habitats that are built in similar fashion around the world. Proponents of large-scale projects usually argue that they can replace local practices and infrastructures in order to provide services more effectively. This may be true in some cases. However, usually biocultural homogenization, driven by cloned habitats and linked to life habits embedded in global development policies, conveys benefits for relatively few co-inhabitants.

Co-inhabitant is a central notion to support Rozzi's (2018a) critique of biocultural homogenization. When the majority of human beings and other living beings are seen as co-inhabitants, active subjects with an intrinsic value, biocultural homogenization becomes a question of socio-environmental justice. When local communities are forced to migrate to other places with promises of a prosperous future made by development projects and policies, most often human lives and a myriad of other living beings are sacrificed. Also lost are the relationships of co-inhabitation that humans have established with other-than-human co-inhabitants in specific socio-ecosystems. As alternatives to homogenizing practices, many resilient communities are currently promoting initiatives to restore (or conserve) co-habitation relationships in rural and urban areas.

The concept of *riversphere* and the metaphor of *meandering*, proposed by Irene Klaver (2018), serve to illustrate the case of re-creating a resilient community even in the context of highly homogenized contemporary cities. The Los Angeles River in California was channelized in the 1950s, and co-inhabitation relationships embedded in material culture and everyday symbolic expressions disappeared. Today, however, the river and some of these relationships of co-inhabitation are partially restored. The Los Angeles River meanders throughout history, and meandering is a metaphor that helps us to understand the wicked problems of biocultural homogenization. Klaver associates the sinuous movement of rivers carving landscapes with forms of non-linear and non-deterministic thinking. With a meander model of the riversphere similar to the model of the "3Hs" of biocultural ethics, she first visualizes how a sociocultural economic practice or *habit* (damming, channeling, selling, and diverting waterways) leads to homogeneous *habitats* (infrastructure, paved-over or concrete "riverbeds," and aqueducts) with a consequent reduction of communities of *co-inhabitants*. Conversely, she proposes that the 3Hs model could also "enable a reorientation towards re-connecting to rivers and re-valuing, re-vitalizing, and re-imagining riverine relations within processes of biocultural conservation and cultural diversification. Such a new cultural habit, including a biocultural mentality, would diversify habitats and broaden the spectrum of co-inhabitants' survival and well-being" (p. 50).

In the chapter "Biostitutes and Biocultural Conservation: Empire and Irony in the Motion Picture *Avatar*," Bron Taylor (2018) portrays the polarization between mentalities of biocultural homogenization and conservation. James Cameron's science fiction film *Avatar* has been praised as a substantive defense of biocultural conservation and, at the same time, criticized as another expression of biocultural homogenization because it simplifies the polarization between local communities and corporative capitalism. To tackle this polarization, Taylor problematizes the role

of scientists whose naive objectivity helps to create a mentality where local communities would have no choice but to cede their territories, leading to homogenization of habitats through land-grabbing processes. Taylor uses the notion of *biostitutes* (a term that blends the words biologists and prostitutes) to critique how some scientists “serve, willingly if sometimes ambivalently, a capitalistic economic system that seeks to maximize profit and places little if any value on the habitats and cultures it must exploit to continue with its expansionist *raison d’être*” (pp. 76–77). Taylor points out that the film exposes how these scientists can become catalyzers for homogenization of life habits by “befriending” indigenous people, “learning from and about them” in order to be able to mitigate the changes being forced upon them. Much as Klaver points out forms of nonlinear and nondeterministic thinking, Taylor highlights ambiguities involved in biocultural homogenization. The series of case studies and concepts presented in our book elucidates how the multivariate roles and intentions of actors involved in development and/or conservation projects cannot be reduced to simple, dichotomous polarizations. The film *Avatar* has been criticized for its standard neocolonialist plot structure, in which local communities need help from “a hero” to survive. However, this film has the merit of triggering discussions about the ambiguous and complex nature of biocultural homogenization, including multifaceted roles played by scientists and other actors in this process (see Taylor 2013).

A current case study of collision of viewpoints and interests is presented by Fouad Makki (2018) in “The Political Ecology of Land Grabs in Ethiopia.” The confluence of the 2008 world economic crisis with global food and energy crises has generated a frenzy of large-scale land acquisitions across the Global South. In this chapter, Makki criticizes how “the privatization of peasant holdings and the village commons is viewed as the inescapable prerequisite for bringing the benefits of the new green revolution to Africa” (p. 84). The World Bank and other international financial institutions are promoting a narrative of *terra nullius* to designate so-called “underutilized” spaces as ideal for large-scale commercial development. This ongoing policy seriously threatens native habitats and customary life habits of peasants and nomadic agropastoral communities for whom transhumance is linked to ownership of livestock and communal appropriation of pastures. Today a distorted representation of the Ethiopian habitats and habits as “unproductive” hides two facts: (i) these habitats include the world’s second largest forest reservoir of overland mammal migrations and (ii) the life habits in the *res communes* support equitable and sustainable agroecological practices.

A recent case where concerns of local communities and technical recommendations were not seriously considered by a megaproject is presented by Haruf Espindola and Claudio Guerra (2018). In 2015, the largest socio-environmental disaster in Brazil’s history occurred in the Rio Doce basin, when a dam belonging to the world’s second largest mining company ruptured. Espindola and Guerra point out that the company framed the disaster as an accident, while those whose daily lives and habitats were destroyed called it a crime.

Roy May (2018) presents the case of a hydroelectric dam project in Latin America that exposes the difficulties for local communities to be heard. In 2016,

Berta Cáceres, an indigenous Lenca environmentalist from Honduras who was awarded the prestigious Goldman Environmental Prize in 2015, was murdered as retaliation for her opposition to the dam. In her prize acceptance speech, Berta affirmed that “the Lenca people are ancestral guardians of the rivers.” However, guardians of the environment are severely repressed worldwide. In 2017, another Goldman Prize winner, a Tarahumara indigenous environmentalist, Isidro Baldenegro López, was shot to repress his leadership in the struggle to protect the pine-oak forests of Mexico’s Sierra Madre mountain range. Since 2002, across the globe, at least 1176 environmental leaders have been murdered. May concludes that “the constant intimidation and murder of defenders of land rights of indigenous and peasant people and the imposition of economic enterprises inappropriate to ecological conditions, demonstrates the persistent coloniality that affects nature and people” (p. 109).

Coloniality and biocultural homogenization are interwoven. Coloniality involves displacements of both local cultures and local biota. Bernd Lenzner and collaborators (2018) undertake a historical perspective to analyze Europe’s central role in introducing species into regions outside their native range worldwide. They highlight that from the fifteenth to the nineteenth centuries, Europe’s processes of global trade implied “alien species introductions [that] lead to the breakdown of biogeographic barriers, thereby promoting a homogenization of the world’s biota” (p. 125). In the twentieth century, expansions of world markets and global connectivity intensified these homogenization processes with profound effects on the displacement of species around a continuously more globally interconnected world.

Miguel Esteban (2018) undertakes a historical perspective to show how European Renaissance and Modern art have contributed to cultural homogenization by uniformizing the construction of images of the fauna discovered in Africa, Asia, and the Americas. Isolated from their habitats, animals were painted against European symbolic backgrounds. To illustrate this point, Esteban focuses on Albrecht Dürer’s famous portrayal of the Rhinoceros, a “pictorial construction of the otherness of exotic animals [that] reaffirmed the beneficial exceptionalism of Europe and, consequently, reinforced the legitimacy of Western colonization of a wild and alien nature, waiting to be reduced and converted into merchandise” (p. 137). He proposes that if we aim to reorient these trends of biocultural homogenization toward biocultural conservation, then it is critical “to denounce the construction of homogeneous biocultural habitats based on habits such as visual production and the consumption of images” (p. 137). Angelina Paredes and Rozzi (2018) undertake this task by deconstructing the “imperial eye” under which Latin American landscapes and inhabitants are perceived and portrayed. A critique of this exoticism enables a better appreciation of Latin American artistic, literary, and political concepts and movements that have revalued local geographies and co-inhabitants, including the political subjects, their identities, and their cultures. A major contribution offered by Latin American environmental arts, schools of thought, and movements is an alternative eco-epistemology and aesthetic hermeneutic to both recover and build a new understanding of nature as a subject, where we co-inhabit.

Part I concludes with a critical analysis of biocultural homogenization associated with the taxonomic bias found in the work of one of the principal European modern philosophers. Rozzi (2018b) focuses on the eighteenth-century Scottish empiricist philosopher, David Hume. In his complete works are 510 mentions of animals; among them 97% are vertebrates, and only two species, horses and dogs, account for more than 50% of the occurrences. This narrow spectrum leaves out the most diverse groups of animals worldwide: invertebrates, which encompass 95% of the known species. It is noteworthy, however, that although in his complete works, Hume included only three references to invertebrates, one of them portrayed an oyster as a sentient organism. In this way Hume stated a relevant attribute that is common to vertebrates and invertebrates and provides philosophical foundations for the ethical consideration of all living beings. Moreover, this finding in Hume's work shows how within dominant Western modern thinkers we can also find "fractures" or alternative perspectives for overcoming taxonomic biases and other drivers of Eurocentric biocultural homogenization.

1.3 Part II: Biotic Homogenization

Part II focuses on biotic homogenization, analyzing and proposing novel links with cultural and social dimensions. To undertake this task, it presents perspectives and case studies from South and North America, which approach biotic homogenization at different scales: from species assemblages to ecoregions. Daniel Simberloff (2018) introduces the concept of bioculture defined as "human populations, other species, habitats, and 'the totality of interaction biological and cultural relationships'" (p. 207). With his ecological perspective, Simberloff's definition is complementary to the one given to this term by humanists who have proposed that "culture and history must be rethought with an understanding of their inextricable, if highly variable, relation to biology" and that "biology, as a science, cannot exist outside culture; culture, as a practice, cannot exist outside biology" (Davis and Morris 2007, p. 411 and p. 418, respectively). These ecological and humanist perspectives broaden the biocultural approach to overcome the split between nature and culture and the onto-epistemological divide between biology and culture (cf. Rozzi 2013). Simberloff then problematizes the discussion by arguing that nonnative species can also be part of biocultures and may even replace native species to form new biocultures. He invites us to investigate the extent to which biotic homogenization can produce characteristically distinct biocultures and to identify traits or characteristics that could be assessed for comparing ancient and newer biocultures. From an ethical point of view, he cautions that there is nothing necessarily xenophobic about the goal to preserve traditional biocultures. This goal could be motivated by general principles equivalent to those that support the right of human societies to maintain their cultural distinctness (UNESCO 2001) or by understanding the intrinsic value of native co-inhabitants, their life habits, and habitats (Rozzi 2012).

Martin Nuñez and collaborators (2018) tackle the question of why some nonnative, even invasive, species become deeply integrated into local and regional cultures, while others do not. A striking example is provided by *Eucalyptus* trees from Australia that were planted in California at the beginning of the nineteenth century and later became invasive. In the early twentieth century, a major school of art focused on *Eucalyptus*. Despite the demonstrated negative impact on other native species and other ecological problems caused by these invasive trees, there is a strong opposition to removing them (Nuñez and Simberloff 2005). Nuñez et al. identify five key factors that make people support or reject management of invasive species: arrival time, economic impact, aesthetic value, effect on human health, and origin of nonnative species and of human immigrants. They conclude that local support is critical for achieving effective management plans and propose that educational programs take into account these factors when explaining the problems that invasive species produce.

Ramiro Crego and collaborators (2018) offer a complementary approach by focusing on multispecies invasive assemblages. They illustrate how a North American temperate-subarctic assemblage of three mammal species (beavers, muskrats, and minks) was introduced into the southern end of South America in sub-Antarctic Tierra del Fuego in the mid-twentieth century, because of a Northern Hemisphere habit: fur trade. They show how biocultural interactions dynamically respond to changes in cultural and economic habits and to subsequent reassembling of introduced species associated with changes in the ecological interactions among introduced and native species. In a parallel case study but with plants, Rafael García and collaborators (2018) describe the introduction of Northern Hemisphere tree species of the genus *Pinus* or pines into temperate South America, which is characterized by the dominance of broadleaf tree species and has no native species of *Pinus*. Despite the demonstrated ecological problems caused by these species and the invasive character they have acquired, commercial *Pinus* plantations continue to expand. García et al. conclude that to mitigate the impacts caused by pines, it is important to implement comprehensive landscape planning and to understand better how pine plantations could coexist in diverse landscapes without affecting and damaging other land uses.

In tropical latitudes, Rafael Zenni and collaborators (2018) examine biotic homogenization in one of the world's biodiversity hotspots: the Cerrado, a vast savannah of grassland, woods, and dry forest located mostly in central Brazil and parts of Bolivia and Paraguay. It is characterized by rich biodiversity and high endemism but since the 1970s has been subjected to increasing development and economic pressures that are converting this unique ecoregion into agriculture and pasture lands, as well as urban areas and infrastructure. Zenni et al. review the evidence of a myriad of biological invasions that are underway in the Cerrado, from grasses to insects, which threaten biodiversity. They plead for greater social awareness about the rapid biotic homogenization in the Cerrado and urge collaboration with management plans to mitigate its impact.

Unfortunately, biotic homogenization not only affects heavily anthropogenized ecosystems, it also affects relatively pristine protected areas. National parks face

many of the same threats to biodiversity as non-protected areas, including nonnative species invasion. Li and collaborators (2018) present a comprehensive analysis of taxonomic and phylogenetic homogenization across US national parks, based on species composition for bird and plant assemblages (considering and excluding nonnative species). They find significant patterns of homogenization and show that these patterns can be complex because taxonomic and phylogenetic homogenization can be decoupled (based on their research on birds). The authors appeal to the important role that national parks have played for cultural identity, biodiversity conservation, education, and recreation in the USA, in order to call for the protection of these areas from threats such as biotic homogenization. In the last chapter of Part II, Alexandra Safiq and collaborators (2018) measure biotic homogenization at the scale of species assemblages by tracking taxonomic changes between 1994 and 2015 on the Atlantic coast of Florida, USA. They track taxonomic changes of fish assemblages and find that sites closer to populated coastlines or that have been subjected to substantial disturbance events are more likely to show homogenization. Interestingly, protected coastal sites show little evidence of biotic homogenization, and the authors propose that societal values as well as divers' practices and experience can help avoid homogenization. Therefore, protected sites or areas play a role in controlling biotic homogenization, and with biocultural education, these areas could be sustainably used for ecotourism and other regulated activities.

1.4 Part III: Biocultural Conservation

The chapters in Part III offer conceptual frameworks, cultural traditions, and practical applications to biocultural conservation. Conceptual frameworks include the foundations of the biocultural ethic, the United Nations agenda, and the indigenous worldviews seldom included in public policies. The cultural traditions include the *Candomblé* of Brazil, the aesthetics of European gardens and their relationship with Taoism and illustration, and the thought and action of the theology of liberation. The practical applications include local community movements in Brazil, India, and Inner Mongolia, China, and conservation and participatory restoration projects in Costa Rica and Japan, respectively. The objective of Part III is to provide a diversity of approaches to biocultural conservation, combining work from local to global scales.

Rozzi (2018c) begins by proposing that the conservation of habitats and life habits is so critical today that it constitutes an ethical imperative that should be incorporated into government policies as a matter of socio-environmental justice. To implement this ethical imperative, it is essential to reorient global society toward fostering a bioculture that effectively integrates ontological, ecosocial, and ethical foundations into education, policies, and governance. The transformation of the prevailing educational and policy-making systems will require a great degree of participation by intellectuals, communities, and social movements of the Global North and of the Global South, the West, and the East. This greater participation will help

to remove the mantle of a universal discourse (with its forms of governance and education) that has denigrated and made invisible the multiplicity of vernacular worldviews, local knowledge, language, practices, and ecological values that still exist and are defended by diverse communities across the planet. Rozzi's criticism is that the Modern Era has been erected on supposed universal knowledge, thus conveying a univocal sense of reality that is presented as epistemologically and technologically superior and that has been institutionalized through its iconic higher education institution: the *uni-versity*. Epistemological homogenization is the basis of biocultural homogenization.

Alexandria Poole (2018) criticizes the 17 Sustainable Development Goals (SDGs) recently launched by the United Nations (UN) General Assembly in its Resolution of September 25, 2015, entitled "Transforming Our World, the 2030 Agenda for Sustainable Development." This document is proposed to be "a plan of action for people, planet, and prosperity." According to Poole, although the 2030 Agenda intends to account for the shortfalls found in the original UN Millennium Development Goals, the "SDGs still neglect fundamental qualities of cultural sovereignty that are key for maintaining sustainable practices, values, and lifestyle habits" (p. 315). To solve this omission, Poole proactively argues that the UN should consider including an eighteenth SDG that acknowledges biocultural heritage. With a complementary approach, based on his long-term work with base communities in Bolivia, Xavier Albó (2018) interprets the concept of "living well," *suma qamaña* in Aymara or *buen vivir* in Spanish as the fundamental moral logic that guides the life habits of Aymara and other Andean cultures and that even has been incorporated into the national constitutions of Bolivia and Ecuador.

Laura Zanotti (2018) focuses on the biocultural heritage and conservation movement of the indigenous Mëbêngôkre-Kayapó people in the Brazilian Amazon. Zanotti points out the tensions between indigenous and conservation views and between Kayapó biocultural perspectives and national and international sociopolitical and institutional contexts. Regarding the first tension, she states that "while river and riparian habitats are central to Kayapó livelihoods and political goals, Kayapó understandings of aquatic landscapes are not central to national and international visions of sustainable Amazonian futures" (p. 343). Regarding the second tension, she focuses on the construction of the third largest hydroelectric dam in the world, Belo Monte. Despite 30 years of conflicts, the demonstrated negative impacts it would have on the Kayapó indigenous people and other local communities and their habitats, and over the opposition of the Inter-American Commission on Human Rights that challenged the constitutionality of the project, Belo Monte Dam was inaugurated in 2016. This case alerts us to the serious constraints facing biocultural conservation projects today.

A different outcome and approach are discussed by Felipe Montoya-Greenheck (2018) based on a participatory action research (PAR) project in the Ngöbe Indigenous Territory in southern Costa Rica. He concludes that by the end of the project, they "had more questions than answers" (p. 372). However, they found obvious differences between the Ngöbe-controlled lands, which remain mostly covered by old-growth forests with only small cultivated patches for family orchards,

and the neighboring lands, which are mostly in the hands of corporate agro-industrial producers and nonindigenous rural communities that clear-cut the forest to “clean” it for planting maize or introduced grasses for livestock grazing. Montoya-Greenheck concludes that it would not be so difficult “if the process of biocultural homogenization would be simply the advance of one aesthetic favoring standardization over another aesthetic with a penchant for diversity” but explains that “the issue is much more complex and broader in scope. . . . it is a matter of ethics, of right and wrong. Questions like who gets to live and who must die are a matter of socio-environmental justice (Rozzi 2013) and are intimately bound within the homogenization-diversity clash” (p. 376).

Egba, egba, enigma lati bereFeran aye, anytime is the time to begin to love nature, is the Yoruba proverb that opens the chapter on Candomblé, an African-origin religion widely practiced in Brazil. Silvia Regina da Lima Silva interviews *Babalorixá* Paulo José dos Reyes (2018) to uncover the intimate and unique relation of Candomblé with nature. They concisely introduce a historical and cultural account of the Yoruba people who arrived in Brazil during the final period of slavery (eighteenth and nineteenth centuries). To overcome biocultural homogenization, it is indispensable to listen to and to dialogue with worldviews and cultural practices such as those associated with Candomblé. This intercultural hermeneutic exercise implies moving from the “only one truth” paradigm to an understanding that there are “other paradigms,” a “diversality” as opposed to the “universality” (sensu Mignolo 2011). Focusing on a Candomblé community that was recently legally recognized as “*quilombo* land,” they conclude that it is possible to learn new and different forms of living; moreover, “the relationship to the earth, the natural environment, needs to be understood from other paradigms” (p. 389).

Based on their long-term experience with *liberation theology* in Latin America, Roy and Janet May (2018) assert that “this theology is a force for cultural diversity and local respect in an ever-increasingly homogenized world order” (p. 393). Solidarity, cultural identity, and diversity are core values of liberation theology that today are expressed through a cultural aesthetics embodied in liturgies, hymnody, poetry, and visual arts. These art forms are ways of protesting injustice and reinforcing resistance and hope for marginalized and oppressed communities.

National-level policy changes can also contribute to, or hinder, biocultural conservation efforts. Ruifei Tang and Michael Gavin (2018) analyze how policies of the Chinese government have driven profound changes in land and resource ownership, which in turn impacted social-ecological conditions in Inner Mongolia from the 1960s to the early 2000s. Government actions forced the privatization of land and resources, removed the rights of communal organizations to government committees, and centralized social services, thereby undermining traditional practices and knowledge systems in the grasslands of Inner Mongolia. This shift also had negative ecological consequences leading to desertification processes and the loss of saxaul (*Haloxylon ammodendron*), a keystone shrub species in the Gobi Desert. However, recent conservation initiatives have triggered positive changes in grassland management. These are based on local knowledge, revitalization of the traditional practices of Mongolian herders, as well as allowing support from conservation and develop-

ment organizations that have added other forms of knowledge and sources of funding at regional, national, and international scales. Based on these conservation case studies, Tang and Gavin conclude that greater adherence to principles of biocultural conservation (*sensu* Gavin et al. 2015, 2018) may lead to interrelated positive social and ecological outcomes.

A different case of biocultural conservation has taken place in the Western Himalayas. Pandurang Hegde and George James (2018) portray the Chipko Movement, an iconic grassroots environmental movement of India initiated in the 1970s. This movement has inspired other conservation initiatives, such as the Appiko Movement in the forested region of southwestern India. Both *Chipko* and *Appiko* mean “to hug,” referring in this case to literally hugging trees and inspiring a strategy of non-violent resistance to protect biodiversity, traditional life habits, and local access to forested habitats.

The Japanese word *saisei* resonates with the biocultural ethic. *Saisei* means more than ecological restoration; it means a revitalization of life habits and habitats. Mitsuyo Toyoda (2018) demonstrates how re-vitalizing the commons in estuarine ecosystems has stimulated local participation, from children to elders. She introduces an innovative case study of restoration of “secondary nature” in rural and suburban coastal ecosystems rather than untouched nature in remote areas. This case highlights how local ecological knowledge is dynamic because it is based on the new tradition of oyster fishing that began only in the twentieth century. At the same time, these revitalizing practices maintain the traditional Japanese spirit of “commons” as expressed by the word *sato*, which signifies the close interrelationship of nature and culture and the importance of shared management of natural resources. This notion is known globally through *satoyama*, meaning commonly used forest, but it reaches more broadly to *satoumi* referring to commonly used coastal resources and *satogawa* to commonly used rivers. The notion of *sato* has encouraged people to reinterpret the values of commonly used natural resources while taking into consideration current pressing socio-environmental issues.

The Garden as a Representation of Nature: A Space to Overcome Biocultural Homogenization? This is the question posed by Tetsuya Kono (2018) in the closing chapter. By comparing French formal gardens and Japanese *Daimyo gardens*, he explores how gardens can play an important role for achieving biocultural conservation or, instead, how gardens can be an expression of and contribute to biocultural homogenization. In European and Asian garden traditions, there are both remarkable similarities and contrasts about the design, motivations, and values associated with the gardens. Kono proposes that “a good garden of today must neither be a garden which represents a universe rationally organized from a privileged viewpoint such as Versailles, nor a garden which represents an ever-fertile farm and orchard useful only for human beings, nor a garden which represents Taoist paradise such as Daimyo Tei-en, but a garden which represents sustainability and coexistence of nature and human society” (p. 474). He concludes that “a better understanding of the aesthetic, political, and cultural values of gardens in these traditions can serve as a basis to better foster biocultural conservation and prevent biocultural homogenization” (p. 460).

1.5 Concluding Remark

This book's ultimate objective is to stimulate a research agenda in biocultural homogenization and ways to reorient this process toward biocultural conservation. Through its concepts and case studies, this volume invites readers to consider further the wealth of biocultural worldviews and practices existing across the globe. These biocultural worldviews and practices markedly contrast with the monoculture of consumption established by a global hegemonic economic discourse. As stated by Rozzi (2018c) in chapter 19, "The current trend of disconnection of global society from biocultural diversity represents an anomalous life habit. This trend needs to be reoriented in light of the values and practices that are still alive in a plethora of cultures and people who have vital awareness of ways of co-inhabiting with diverse co-inhabitants" (p. 311). Toward this end, this volume is a first attempt. We hope, however, that it will stimulate further research about the interrelations between the homogenization (and or conservation) of native habitats and the life habits of the diverse co-inhabitants that co-inhabit them. Such a research agenda could serve as a bridge for considering the global, as well as the local, interests of the communities that inhabit the heterogeneous regions of the planet. The visualization of the interrelations between the homogenization of habits and habitats and the consequences it has for the well-being or the displacement of human and other-than-human co-inhabitants can inform and provide insights for decision-making in environmental policies, development, and educational programs. If the essays in this volume contribute to this visualization and associated actions, this book will have fulfilled its purpose.

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