Death and Life of Nature in Asian Cities

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Introduction

The chapters in this book bring questions about ecological vitality into conversation with the everyday human experiences that shape the form and meaning of urban nature. Such a conversation reaches beyond the question of what "counts" as urban nature in a given time and place and invites us to think through the many nested scales at which nonhuman life, death, thriving, and withering come into being. Although the juxtaposition of death and life might suggest stark contrasts between beginnings and endings, our core challenge is to regard the making and unmaking of urban nature as a dynamic, ever-continuing, social-biophysical process.

Our collective starting point is the uncertainty, and yet generativity, of the Anthropocene—an era distinguished as it is by wholly new forms of nature, and long legacies of human nature making and re-making.[1] For some, it is a reminder of a more cataclysmic and epochal death of nature that might well be caused by hegemonic industrial-urban processes around the world (see Zalasiewicz et al. 2008; Bonneuil and Fressoz 2016; Malm and Hornborg 2014). Recognizing that nearly two decades of vigorous debate have scrutinized its underlying assumptions, we echo recent work by Dipesh Chakrabarty to note that conflicts between historical and geologic understandings of time remain at the heart of discussions and experiences of the Anthropocene (Chakrabarty 2018).[2]

Our engagement with this concept is informed as well by the work of Kathleen Morrison, who has noted its hidden Eurocentrism. Starting with European history as its prime temporal frame, she argues, has united the scientific community with humanists and brought otherwise disparate modes of thought into a unified attempt to fit social relations into determinative models. Such easy alliance across disciplines

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1. See Waters, Zalasiewicz, Summerhayes, and Banrnovsky (2016); for a sense of what may remain possible on a planet fundamentally depleted by industrial civilization and its insatiable appetites, see Tsing, Swanson, Gan, and Bubandt (2017).

2. Earlier reflections on concepts and historical scope include Steffen, Grinevald, Crutzen, and McNeill (2011).

is harder to sustain when experiences and understandings outside of European trajectories are taken more seriously (see Morrison 2015).

In addition to historical and philosophical debates, as one of us has previously written, "there is also increasing disquiet in some quarters with the fact that some humans (very few as a proportion of the world population) created the problems, and the ones least responsible face the worst effects. . . . If humans are seen as one race, or species, brutalizing the earth, such a view obscures the reality of huge discrepancies that have emerged amongst humans in power and wealth over modern historical time" (Sivaramakrishnan 2019, ix–x). Arguably, these profound inequalities, amplified by the death of nature writ large, are strikingly evident in urban life. This is vividly so in Asia.[3]

In invoking the death and life of nature in cities, then, we remain mindful of the ways that the very concept of the Anthropocene hinders a discussion of environmental justice issues. This becomes even more salient when our notion of justice extends to the rights of nature, and to analyses that focus on the varieties of nonhuman lives threatened or expelled in the making of modern cities and towns. This book is thus also a call to reflect upon, and to anticipate, how we might more carefully study nature and contemporary city life continuously co-produced. This requires, we argue, keeping inter-scalar relations, spatial variations, and social differences firmly in our sight to discern where and how shared ecological and social processes generate distinct experiences.

Examples within twenty-first-century Asian cities include the uneven distribution of health risks posed by air pollution, struggles for potable water, and large quantities of urban waste in cities like Delhi or Beijing. While waste, for example, may generate precarious livelihoods, it can also present immense hazards to the poorest workers who handle its disposal or live in its close proximity. In the case of Phnom Penh, we might note that even a well-articulated sewage treatment system produces dangerous marshlands, offensive odors, and organic material in which poor squatters grow a variety of vegetables (Jensen 2017, 636–37). At least in South Asian cities, emaciated cows and goats might be seen jostling for space with well-fed and beautifully groomed thoroughbred pets. Uneven distributions of, and access to, green spaces in cities across Asia serve as reminders of a twofold exclusion: the social exclusion of underprivileged city-dwellers and the subordination of plants and fauna to the crafted aesthetic of the verdant Asian city.

The Death of Nature Re-imagined, in the City

In many North American academic discussions in the field of environmental studies, the phrase "death of nature" may call up visions of decades-old warnings,

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3. For a sweeping and compelling account of growing economic disparities and their effects in the world, see Piketty (2014).

once traced by the likes of Rachel Carson's *Silent Spring* (1962), Bill McKibben's *The End of Nature* (2006), or Carolyn Merchant's *The Death of Nature* (1990). More contemporary students in that same field may think first of public intellectual voices like those of Elizabeth Kolbert (2015) or Amitav Ghosh (2017). While the earlier warnings sounded by writers like Carson were, in many ways, genesis narratives for entirely new political missions, social collectives, and, indeed, academic subfields, we notice that "nature," in that earlier historical moment, was still largely regarded as the thing that stood in opposition to the city. In dominant Western sociocultural imaginaries, nature in that era was not only absent from cities but completely separate from modern social life. Nowhere was the death of nature more visible, in this mode of thinking, than in cities.

Today, across Western academic and popular discourses, the conceptual content of "nature," and our ability to trace its existence in social life even in the most densely populated cities of the world, has changed profoundly. We now hesitate to separate human beings from nature, ecology, or the environment, and in fact recognize "urban ecology" as an arena for substantive inquiry rather than a puzzling oxymoron. And yet, we still inhabit a planet whose ecological present is perhaps most accurately conveyed through human accounts and experiences of loss and death—whether they take the form of our expectations of eco-collapse and catastrophe, or they fuel urgent missions to shore up something called "resilience."

In this *Sixth Extinction* era marked by what Ghosh (2017) has characterized as a "great derangement," we are acutely aware of the biophysical costs of our long global history of empire and industrialization. New accountings of loss emerge at an almost dizzying pace, documenting mass die-offs,[4] oxygen-starved oceans, entire islands of plastic waste, and an irreversible loss of unfathomable biodiversity.[5] At this writing, cities worldwide are held in the grip of a global pandemic that has brought renewed attention to our interactions with the nonhuman world, and how dramatically changed ecologies and ecosystems can always introduce new consequences—some involving previously incomprehensible human social experiences of loss.

We begin our exploration of *Death and Life of Nature in Asian Cities*, then, by noting that in scientific, social scientific, and cultural registers, the death of nature, however we may have reconceptualized nature itself, is perhaps experienced now with more gravity and socio-ecological traction than ever. We further suggest, in the spirit of Bruno Latour's now-classic investigation of the modern historical human subject, that our studies inevitably confront the predicament of the Modern (in his use of the term), whereby those who have spread out to fill all available space now find themselves lacking room. In his account, this quest for space, which he also renders as a place to situate existence in the world, leads to a "groping in the

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4. For example, Hallman et al. (2017).
5. Kolbert (2015) estimates flora and fauna loss by the end of our century to be between 20 and 50 percent of all living species on earth.

dark," for it reveals the sense of unsettled feeling that comes with "brutal expulsion . . . from the entire habitable Earth" (Latour 2013, 104). For us, Latour is not only advocating an anthropology of the Anthropocene era's predicament of modern humans, but he is also leading us toward a mode of inquiry that is deeply informed by the emergent concerns of the environmental humanities.

What do we mean by the environmental humanities? In the inaugural issue of the journal *Environmental Humanities*, Deborah Bird Rose and her colleagues offered a useful set of programmatic definitions that guide us. They note how much environmental research, even in the human sciences, previously proceeded with a "narrow conceptualization of human agency, social and cultural formation, social change, and the entangled relations between human and nonhuman worlds." They suggest that the development of the environmental humanities might "enrich environmental research with a more extensive conceptual vocabulary, whilst at the same time vitalizing the humanities by rethinking the ontological exceptionality of the human." Specifically, "the humanities have traditionally worked with questions of meaning, value, ethics, justice and the politics of knowledge production. In bringing these questions into environmental domains, we are able to articulate a 'thicker' notion of humanity" (Rose et al. 2012, 1).

Apart from scientific and policy responses to global environmental change, environmental humanities responses tend to focus on fundamental questions of meaning, value, responsibility, and purpose. Since the early 2000s, the physical science account of the Anthropocene is one in which the earth and its atmosphere have been irreversibly altered by human influences on biogeochemical processes.[6] For the humanities, as one set of scholars of literature put it, this has meant that the scholarly imagination now operates on "a wholly different scale, vastly more global in scope, vastly more historical in extent . . . and . . . that [takes] seriously the specific responsibilities that arise from this shifting of perspectives" (Garrard, Handwerk, and Wilke 2014, 149).

Yet we note that capacious notions of humanity that never excluded the nonhuman persisted across Asian societies and continued well into the onset of industrial modernity.[7] In the study of South Asia, the region with which we are most familiar, we would suggest this with even greater assurance, as in that region a thicker notion of humanity was never entirely removed from scholarly perspectives and analytical procedures. Subjects like the deep history of civilizational processes, the colonial encounter, pantheistic or world-renouncing religion, human relations with animals, and the picturesque in the history of art afforded opportunities for exploring the environmental humanities without giving it that name.[8]

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6.   For some of the earliest and authoritative formulation of these ideas, see Crutzen and Stoermer (2000); Crutzen (2002).

7.   Examples of this argument can be found in Duara (2014), Elverskog (2020), and Sivaramakrishnan (2015).

8.   Recent path-breaking work in art history, for instance, has brought human/nonhuman relations in India into environmental humanities at the intersection of religious studies and studies of architectural history. See Ray (2019).

For instance, a robust literature on environmental history emerged in South Asian Studies by the 1990s. This literature often converged with the writings of early environmental activists like Anil Agarwal to argue that nature conservation must move beyond "pretty trees and tigers" to questions of social equity. Destruction of habitats, or biodiversity, also placed the lives of millions of *Adivasis* and other politically or economically vulnerable South Asians at risk. In one sympathetic line of thought, this mode of analysis also enabled the "discovery" of the environmentalism of the poor (see Guha and Martínez-Alier 1997; Martínez-Alier 2002; Peet and Watts 2004). We understand the environmental humanities, then, to denote a moral, political, and artistic commitment that is extraordinary and generative.

Our exploration in *Death and Life of Nature in Asian Cities* aims to take seriously the idea that "a reflexive, anthropocenic cultural politics" (Garrard, Handwerk, and Wilke 2014, 149) can potentially get us beyond the mess created by an anthropocentric hubris that informed the conquest of nature in modern times, especially in the twentieth century. This is also a potential platform on which to unite across the disciplines and epistemic divides that separate scholarly inquiry.

It is in this spirit of inquiry that this book considers the death and life of nature in Asian cities. Its chapters present an array of contexts within which human communities experience the complex, changing webs of urban life. We fix our social and spatial focus on cities: after all, "nature" is not the only concept that has undergone significant rethinking over the past decades. Cities, too, no longer sit comfortably removed from their hinterlands; we now understand them to be integrally connected to far more complex tendrils of exchange, movement, and flow. In their reconceptualized guise, cities are more often understood as nodes along a far more expansive urban continuum—a continuum that encompasses the full range of landscape densities, social communities, and biophysical systems.

If we follow Lefebvre ([1970] 2003) to regard the world as now "completely urban," that is, interwoven in varying ways within threads of late capitalism, then studying nature in cities challenges us to trace their contours across the spatial and social processes that span this continuum; these often include interconnected hinterlands with as much complexity as they do cities themselves. This is as true in social and material terms as it is in biophysical ones: the biogeochemical cycles that undergird any city's ecology rarely start and end with municipal boundaries.[9]

We are also mindful that in the present, neither city infrastructures nor their human populations are necessarily fixed—in space or in place. As we witness the global movement of those displaced as environmental refugees, trace the migrations of those fleeing overt violence and war, and note the complex and varied dynamics of displacement and migration, we are roundly challenged to encounter a planet of cities that is not only rapidly urbanizing but very much "on the move"—marked by

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9. Fine work on ecological footprints of cities, even premodern urban concentrations, has begun to take scholarship to this realization based mostly on work in Europe. See, for instance, Hoffmann (2007).

large movements of migrating peoples in the present, and likely to remain so with evermore intensity.

Cities are also potentially on the move in material terms: regardless of their location, all cities face a present and future scenario punctuated by potentially profound ecological transformation as climate change introduces new stresses and intensifies existing ones. Here, we are reminded of a very recent report by the Intergovernmental Panel on Climate Change on sea level rise (see Oppenheimer et al. 2019). The overwhelming prevalence of large, dynamic, populated cities in coastal areas and the remaking of water-land boundaries that sea level rise ensures come together in this study to underscore the dynamism and uncertainty that is present in the material, built infrastructures that constitute a vast majority of city territories. We therefore must anticipate a coastal city map that is nothing if not dynamic, while we also attend to the uneven human capacity to respond. To consider the death and life of nature, then, is also an invitation to seriously consider human social experiences of vulnerability, risk, and marginality, and to see in new ways how everyday ideologies of social belonging carry profound social and biophysical consequences.

It is in these dynamic circumstances—the lived, everyday life of cities in our time—that we have assembled this volume of careful, case-based work. Our aim is to better understand the coproduction of social and biophysical nature (see Rademacher, Cadenasso, and Pickett 2019), and, we hope, the dynamics that join ecological vitality and human well-being together.

As has been the case across our two previous *Ecologies of Urbanism* volumes, we focus here specifically on Asia as a region in which cities often invoke a palpable sense of becoming. From Asian hyper-cities to smaller cities and towns, these are the urban landscapes that host fourteen of the world's twenty-eight megacities (ten million or more) and that, by 2030, are expected to host twenty-four. When combined with 330 medium sized cities (1–10 million) and 815 smaller cities (with populations of 300,000 to 1 million), Asia emerges as the global center of city-making.

Not unlike the cities of Europe and North America that took shape over the nineteenth and early twentieth centuries, Asian cities emerged in their first modern avatar during the twentieth century: they embodied industrial ambition and governmental power. In so doing, they commissioned the death of nature in many ways. In many situations industrial cities contaminated and killed nature in the form of land and water, but these essential elements returned in their poisoned state to endanger human life and render it painful and insecure. One powerful example of such processes—encompassing mining waste, factory effluents in rivers, and air pollution in studies of Asian urban industrialization—is that provided by Brett Walker (2011) for Japan.

For another example, consider the industrial towns and cities along the middle Ganges in the north Indian plain. These discharge waste, sewage, and factory effluents that often render river water dangerous even for irrigation, let alone bathing or

drinking. This condition persists despite four decades of projects that were designed and executed to control and diminish the pollution of the national river, which is also a sacred river for India's majority Hindu population (Sen 2019, 351). As a recent study of waste and garbage effectively shows, urban refuse in places like India has grown exponentially even as its inorganic composition has rapidly increased. Meanwhile, older systems of collection and recycling have collapsed under the weight of consumer culture, municipal incapacities, and toxic detritus that suffocates many of the channels that nature provided for digesting and removing waste (Doron and Jeffrey 2018).

City infrastructural projects have long sought to contain rivers, build waterworks, and denature the biological life of water bodies in the name of purification, or by treating them as waste disposal sites. Such was the plight of the Thames river in London, for instance, in the aftermath of the Second World War. In 1959, the *Manchester Guardian* called the Thames a badly managed open sewer; its biological oxygen demand under London Bridge was virtually nonexistent (Hardach 2015; see also Kelly 2018). It took another twenty years, and a vigorous effort by government and environmentalists, to clean the river. The Thames now teems with aquatic life and fresh water, as well as opportunities for London residents to find respite or meaning in the urban nature of the river that is inseparable from their city. Many other European rivers can recount similar histories of the death and life of nature.[10] But far fewer such stories yet exist for Asian cities.

As cities in Asia grow and proliferate, infrastructural systems pipe water from rivers and ground sources, suffused with chemical cleaning agents, into homes and other buildings. Along the way, marshes and wetlands are often drained or covered in order to build factories, dwellings, harbors, and commercial hubs. In her study of city-making in colonial Calcutta, Debjani Bhattacharyya describes how such marshes and deltas carried the imprint of premodern engineering, while modern urbanism attempted a more radical transformation of land-water relations. This created an unprecedented killing field for nature by the middle of the twentieth century (Bhattacharyya 2018).

In the same way, colonial and modern city-making in Asia affected soil and vegetation complexes, often the habitat of microfauna and host to rich biodiversity. These were subordinated or submerged below tar and gravel to create roads and highways. Animals that signaled the presence of wilderness or agrarian life in spaces designated for cities were either expelled or displaced to the terrain outside of municipal limits. It is these kinds of enclosures, expulsions, and zoning that demarcated and built a sanitized, human-designed, and human-dominated norm for modern city life in Asia.

This pattern of modern Asian urbanism seemed to emulate at a more breathless pace what had already happened in industrializing urban centers and metropolitan

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10. For a fine study in this vein, see Cioc (2006).

hubs of modern Europe and North America. In the cities that emerged across Europe and North America by the twentieth century, domestic and work animals found themselves increasingly unwelcome. Thus, when it became hard to conceive a safe city for horse and human, the quadruped was displaced to farm suburbs (see McShane and Tarr 2007). In a classic study of Seattle, we learn that various animals were essential to the building of the modern American city in the late nineteenth century, and the removal of such animals was linked to the formation of new middle-class neighborhoods during the twentieth century. As older relations with livestock became more remote, domestic pets emerged as even more important human companions, perhaps another mark of the many deaths for nature, and its many forms, in the histories of America's modern cities (Brown 2016).

Arguably, even as certain animals have returned to cities—by invitation or as opportunistic but unwelcome co-residents—their place in a culturally sanctioned pantheon of living nature in a city environment remains a topic of intense contestation in the USA. We have only to consider the complex urban regulation of farmyard animals as distinct from pets, animals raised for sport and recreation, companion species, and the proliferation of organizations that advocate for and against their fair treatment or rightful place in the city in order to appreciate this point (see, for instance, Haraway 2003; Mullin and Cassidy 2007). This is true in the cities of Asia as well, but the temporalities of animal exclusion differ considerably across cities in North America, Europe, and Asia.

In much of the European and American experience, animal displacement often preceded growing social awareness of industrial pollution. Such animal exclusion has been at the heart of the remaking of nature in the city. One broad trend described by historians of major cities like Chicago, New York, and Seattle is the remaking of livestock-friendly towns of the nineteenth century into pet-friendly but livestock-averse cities by the end of the twentieth century (Brown 2016; Van Horn and Aftandilian 2015).

In Asian cities, these issues often intertwine as part of a late twentieth-century "cleanup" of cities energized by urban environmental movements, governments, and vocal middle-class activists. For example, the plight of cows in Delhi is instructive: having lived in the urban villages that were enclosed as Delhi grew, cows and their *Gujjar* or *Ahir* keepers were key to the city's milk supply into the 1970s. Then the government of India invested in a massive program for the development of national milk production and distribution, which came to be known as Operation Flood. In cities like Delhi, booths vending milk sprung up under the brand name of Mother Dairy. As this system grew into the familiar neighborhood source of safe, refrigerated milk, local *gwalas*, with their wandering milch cattle, were rendered a nuisance—in other words, unwanted nature.[11]

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11. For more on the campaign against stray cows in Delhi, see Baviskar (2015).

In the late 1970s cleanup, resettlement colonies landed in the outskirts of Delhi as part of slum clearance.[12] By the 1990s, the unbridled growth of the city—west, north, and south (the river bounded it to the east)—took it further into the semi-arid scrublands of Haryana and the fertile farms of western Uttar Pradesh. There, monkeys and displaced poor Delhi slum dwellers were forced out together. For the monkeys, removal was a sanctuary they resisted: they returned to the city at will (Gandhi 2012, 47–48). The urban poor found it much harder, as new and unprecedented numbers of migrant workers surged into Delhi city, finding work in construction, domestic service, and other service sectors.

Considered together, these examples from America in the nineteenth and early twentieth centuries and from India in the late twentieth century illustrate how nature was controlled, subjugated, disciplined, removed, or transformed into built city environments that seemed, through manifold deaths of nature, to garner life forces of their own. We might see these forces reflected in engineering marvels, planned vistas, and thoroughly socialized spaces in cities and towns. At the same time, our aggregate, totalizing account is also too simplistic. City-making endeavors were never complete or without contestation. Forms of nature—whether fugitively profuse, tidily manicured, or serviceable in some fashion—remained in these cities.

Their manifestations could be as clusters of unwanted plants, the presence of disease-carrying bacteria, compostable food waste, enduring enclaves of animal life, urban parks and protected areas, green belts, and even avian life adapted to ornamental or fruit trees along avenues and in-home gardens. And nature reappeared as water seeping, overflowing, stilled, in scattered wet zones or flood events, with co-resident fungi and moss, and in the organic matter, or solid waste, that sullied the quality of water in particular places. What we may consider the recalcitrant lives of nature, then, were always at risk, and fitfully being banished. Nevertheless, they persisted.

We've begun our exploration of the *Death and Life of Nature in Asian Cities*, then, by grounding our thinking in historical conditions. This points us toward the political work that was always necessary in order to enact ideal urban visions. It also highlights the subjectivities that individual agents have long brought to the praxis of urban transformation, and to the power relations that organize and legitimate environmental knowledge itself. Contemporary aspirations for urban sustainability and livability are always cast against this uneasy backdrop of historical forms of loss and instability.

What may arise today as excessive pollution and solid waste, water scarcity, insufficient housing conditions, crumbling or absent infrastructure, or—in the most contemporary sense—our realization of the profound vulnerability of coastal cities to sea level rise and catastrophic storms will always have their consequential historical contexts built into their possibilities for the future.

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12. Tarlo (2003) provides a searing account of the human displacement initiated by slum clearance drives in the late 1970s.

In this book, our contributors do not go into the many epidemiological aspects that the death and life of nature in cities invites. It is nevertheless possible to ask how bursts of city development, with attendant piles of refuse, stagnant water, uncovered ditches, and putrefying solid waste create new hazards and patterns of withering; they nurture water-borne diseases, for example, that can rapidly spread in dense Asian cities (see Gandy 2014, 5–6; also, Dasgupta 2012). Many contemporary Asian cities are now embarked on ambitious projects of greening, climate change adaptation, resilience, and restoration precisely in order to fight human health threats like epidemic disease or deadly air pollution. To that extent they are also rediscovering nature in a salubrious, even life-giving, condition.[13]

Lively Urban Nature

Our previous volumes in the *Ecologies of Urbanism* series—*Places of Nature in Ecologies of Urbanism* (2017) and *Ecologies of Urbanism in India* (2013)—helped us organize a systematic exploration of the ways that historical and anthropological sensibilities can be fruitfully combined with engaged attention to the transformative power of nonhuman biophysical processes. In those books, contributors asked: how do we understand social change more fully, and even quite differently, when we consider human and nonhuman nature in an ecologically integrated analytical rubric? Both volumes underlined the ways that specific places and contexts matter, as do the connections forged through flows of capital, labor, and information. To these, we were careful to add the ecosystem-scale transformations that enable or disable those same flows.[14]

In this third *Ecologies of Urbanism* volume, our contributors begin with the assertion that fundamental questions of decay, regeneration, growth, and sustainability sharpen our understanding of social and ecological transformation. Our goal is to see more clearly how nature is made in simultaneous biophysical and cultural process, and how, in that interlinkage, multifaceted death and life are experienced in Asian cities. We assert that topics like sustainability and resilience, which in their most current manifestation are often expressed in ideas like green or smart cities,

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13. Such projects of greening are driven by government programs and business initiatives, as well as growing demand from burgeoning urban middle classes across Asian cities. One recent examination of efforts largely in the corporate sector can be found in Clifford (2019).
14. The analytical rubric of *Ecologies of Urbanism* proceeds from the following assertions:
    - Analytically, "ecologies" is plural: there are many ways of knowing nature.
    - Biophysical conditions and their histories matter, including the colonial spatial and social legacies that are woven into urban landscapes.
    - To understand the city, one has to start with processes, not borders: an urban watershed, a network of tubewells, or an island that is the product of land reclamation are all crucial aspects of "the city" as an analytical category, not just as a territory on a map. This helps us to understand cities as more fluid than their conventional boundaries might suggest.
    - The ecologies of urbanism rubric would recognize a rail corridor as potentially fruitful a site for studying coupled biophysical and social transformation as the large "cities" that they connect as they traverse the landscape.

are about rediscovering human life itself as a multidimensional experience in which varied forms of nature are integral to reimagining urban existence.[15]

Sustainability plays a central role in these considerations. As Paul Warde reminds us, in English usage, the very term "sustainability" is remarkably recent, though its antecedent ideas and practices can be traced to early modern European history. It is, as he further observes, a profound notion that identifies ecological foundations of civilization that must be renewed, protected, and allowed to flourish (Warde 2011).

We do not need to dwell here on the truly vast literature on how the governance of nature became entangled with ideas of social improvement, technological advance, and greater efficiency in the use of natural resources—all classic processes bound up with the rise of modernity in Europe and Asia. It is important to note, however, as Warde does in his comprehensive study, that sustainability grows out of a command-and-control perspective and into a way of being and thinking in nature that recognizes its vastness, richness, and ability to confound human projects of the greatest sophistication (Warde 2018, 11 and 314–49). Such recalcitrance in nature may be feral, as some argue, or manifest in collapsing systems that leave humans vulnerable to previously unimagined danger.[16]

The agency of nature may be celebrated, and even romanticized, in some of these accounts, but we aim in this project to anchor our analyses to wider ecological relations and their uneven production of livelihood, amenities, rights, and justice in cities. This follows provocations from scholars like Amita Baviskar, whose critique of urban environmental activism notes that "ecology is often hard to see in the city. The concentration of concrete and tarmac, brick and glass, seems to squeeze it out of existence. The built environment overwhelmingly appears to be an artifact of human manufacture, of materials transformed by technology" (Baviskar 2018, 90). She is rightly urging us to look beyond ornamental or aesthetic values of nature in the city to its ecosystem functions, unequal accessibility across social classes, and privatization where it might otherwise be part of urban commons in ways that impinges on its ecological value to sustainable urbanism across social groups.

Our perspective on ecologies of urbanism also departs somewhat from more conventional urban ecology. Some work has followed one influential approach, developed in the eastern USA, which traces the shift from the study of ecology in cities to the ecology of cities.[17] In this approach, urban systems are viewed from an ecological perspective, thus including the natural and built environment and all resource use within the urban domain in an integrative framework. Ecological footprint analysis and industrial ecology are two ways in which such ecosystem

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15. For a consideration of the idea of smart cities and its influence in urban planning and policy in India, see Sharma (2018).

16. For the idea of feral plants emerging in conditions of extreme ecological stress, see Tsing, Deger et al. (2020); and Tsing and Bubandt (2018).

17. This pioneering work and resulting framework for urban ecology studies is reported in Grove et al. (2015).

approaches have been fruitfully deployed in the study of cities and other urban concentrations. Considering cities as urban ecosystems, however, is often limited by collaborations that foreground the natural sciences, social sciences, and policy sciences (Grove et al. 2015, 2–14).

These approaches may sometimes conceive of ecology as a set of closed loops, and configure singular connections and flows. A singular ecology, in this kind of analysis, provides a neat system, but it also requires erasures and omissions. By extending our understanding of urban ecology to humanistic perspectives that encompass questions of affect, meaning made in lived experience, and the politics of representation, we employ a framework that pluralizes ecology and permits an examination of ecologies—understood as multiple webs of dynamic connection across human and nonhuman worlds. These webs may be emergent, contested, and often expressive of divergent patterns and processes of change, adaptation, trans-formation, and restabilization. These are also themes central to the environmental humanities perspectives, which we discussed above.

The death and life of nature, in the ways we have been describing it, may in fact have already captured the attention of some ecology advocates. For instance, if we consider two South Indian cities—Chennai and Bengaluru—we might point to examples in the form of tanks in one case and lakes in the other. Both tanks and lakes were part of each city's historical water supplies and built environments. However, in many cases, they suffered a precipitous decline after municipalities took them over. City construction, discharge of effluents, and waste dumping intensified, with tanks and lakes serving as receptacles for the refuse of city life or making way for urban infrastructure like roads, shopping complexes, and institutional facilities.

Urban water tanks assumed a prominent place in the oldest parts of Chennai. Most were likely to be part of a given neighborhood's temple complex. If the *agra-haram* stretched in front of the entrance, the tank lay behind it. The Kapaleeswarar Temple, *agraharam*, and tank in Mylapuru is one emblematic case of this land-scape design.[18] Such tanks were both a communal resource and a sacred space. The decline of the tanks, then, coincided with congestion and profanation. To the extent that they have been rejuvenated, it has been through social acts of reclamation and purification. The democratization of temple entry—as a consequence of temple entry movements in South India that secured access for lower castes over the course of the twentieth century—has played no small part in this revival. Temple revenues increased, they were renovated, and the tanks were revived.

Other factors include a surge in popular Hinduism and visits to temples, with growing interest (even from nonresident Indians) in the upkeep of temples in what they consider to be hometowns or villages (see the key work in this regard by Fuller 2003). The growing prosperity of temples in major cities is also facilitated by visits

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18. The *agraharam* refers to the residential enclave of the Brahmin community in close proximity to the temple, often in the heart of the city, and in fact abutting the outer walls of the temple. Many of the temple priests officiating at the temple would live with their families in the *agraharam*.

from migrant and other professional transients in the city, and the willingness of temple communities to innovate rituals and organize festivals that allow a broader temple-allied public to form and contribute to upkeep.[19]

In the case of Bengaluru, the intertwined functional and moral values of urban water bodies are essential to ecological and cultural ideas about the overall vitality of the city. Thus, Harini Nagendra writes that, "within a few decades, the culture of valuing lakes as water-providing reservoirs, and reverence for lakes as life-giving, sacred entities, have given way to the use of lakes as septic tanks and garbage dumps" (Nagendra 2016, 173). Yet this death of a very specific form of nature has also sparked community-based efforts at resuscitation. In 2015, the organization *Jal Mitra* began to conserve a lake in North Bengaluru and now, six years later, it has grown to act for the revival of other water bodies in the city as well. The group's efforts encompass environmental education, corporate social responsibility projects, and urging the city to execute public works as nature-sustaining rather than nature-destroying projects (Gajjar 2016).

These very brief examples highlight some aspects of what may be considered "post-industrial ecologies of urbanism"—at least to an audience of scholars of the global north. After all, in American cities, the vitality of cities of the future often implies the return to life of certain forms of nature—particularly parks, open spaces, green streets, and community gardens. As Sarah Charlop-Powers (2016), executive director of the Natural Areas Conservancy, writes: "many have come to expect that our urban parks should provide residents with a broad suite of services above and beyond recreation—including flood protection, clean air and water, biodiversity, and respite from the pressures of urban life."

Such revisioning of urban nature as a source of ecosystem services and solace in the city is not absent in the South Asian experience, a topic addressed to some extent in work one of us has done on green spaces in Delhi (Sivaramakrishnan 2017). It can also be found in the planning and developing of "greener" cities across Asia. In this sense, the work in this volume emphasizes the need to consider the production and presence of lively urban nature as a core aspect of varied ecologies of urbanism.

We offer, therefore, an expansive definition of urban nature that is undoubtedly indebted to ideas about urban ecology, environmentalism, and cities as multispecies habitats. We wish to keep in focus the uneven distributions of amenities afforded by forms of city nature, and the ways that rights in, and to, the city are mediated by natural assets and their accessibility. Our concept of urban nature encompasses a material and imaginative realm of human and nonhuman sociality, comprising both mutualism and antagonism that is historically shaped and constantly reshaped in the city.[20]

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19. An excellent account of such processes may be found in T. Srinivas (2018).
20. We are in agreement with Maria Kaika in many respects when she says urbanization strives to "render cities independent from nature's processes" but ends up tying nature and the city into a "socio-spatial continuum"

The contributions to this book illuminate a continuing process of discovery and renewal through which urban natures may well be moving from taken-for-granted infrastructures to more consciously observed and experienced interplays between nonhuman existence and daily life experiences. These provoke moral and ethical evaluations of the human ecology of city life and direct relations between nature and culture into new avenues like aesthetics, care, perception, and stewardship. The book finds nature as often in a walk to the bus stop as in a stroll in a park.[21] It follows what Esther Woolfson (2014) has characterized as the urban natures that emerge through cultivated sensibilities. For some, these are available from unforgotten traditions, and for others they emerge from learning to become a natural historian and to be alert to nature in manifold forms and surroundings.

We find these conversations emergent among scholars of the environment from diverse backgrounds. The work in this book is conversant, for example, with a set of essays by Terrell Dixon. There, Dixon (2002) shows how rivers, parks, vacant lots, lakes, gardens, and zoos convey nature's rich disregard of city limits signs, each in their own different ways. New ideas about resilience and sustainability follow. Though Dixon's exploration of urban nature may draw from styles of documentation found in Europe or North America, they are not unfamiliar to Asian contexts.

Globally circulating modes of cosmopolitan urbanism related to environmentalism, conservation, organic farming, greening urban space, and so on are of course available to many residents of Asian cities and towns. Such practices also emerge, however, from distinctive modalities of Asian city life created in historically layered urban experience: these encompass empires, colonial encounters, and global city building across socialist, capitalist, or neoliberal regimes of investment and urbanization.[22]

The chapters to follow, then, trace some of the myriad ways that city dwellers formulate and experience instances of urban nature, its passing, and its renewal. They highlight material and imaginative processes that are unfolding in diverse patterns across Asia. One such process is the rapid urbanization of Asia across big cities, smaller towns, and the newest urban concentrations that enclose farms, woodlands, or other land uses.[23] The other is the contentious debates and novel schemes by which nature—all of nonhuman life and the inanimate world—is figured and emplaced in cities and their conurbations.

In the growth of cities and towns, and in their greening, we wish to underscore how new possibilities for foregrounding environmental or sustainability goals can

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(see Kaika 2004, 5). She is, of course, working in a renowned Marxist tradition in thinking about urban nature. This might be traced to David Harvey (1996), who argued that cities are dense networks of interwoven socio-spatial processes that are simultaneously human, material, natural, discursive, cultural, and organic.

21. We are inspired here by work like Johnson (2016).

22. One example from India would be Krishen (2006).

23. A good example of how urbanization with all these elements also produces vivid disparities in the way modern urbanism is experienced and described across social classes may be found in works like Harms (2016), Ghertner (2015), Searle (2016), and Schwenkel (2020).

emerge—be they in the form of green architecture as an emerging field of urban practice in Mumbai (see Rademacher 2017), or the greening effects of verticality in dense, undulating, and compressed land masses like Hong Kong (see Shelton, Karakiewicz, and Kvan 2010).

The chapters in this book also amplify how the intersection of urban growth and urban nature is a place rich with fresh ideas about urban planning, governance, and social life. It is a site of novel forms of politics and new subjectivities that individual agents bring to the praxis of urban transformation. Yet these are always in tension with new, and newly legitimated, forms of social exclusion and boundary-making. Moreover, when nature is valued in specific ways—for example, by an ecosystem service provider in a city aspiring to resilience or aesthetic appeal—we find that while nature itself can take on fresh meanings for urban residents and planners, so too can specific, often already-marginalized, populations.[24]

Each chapter of the book presents a case study, and together they survey cities across Asia. Drawing on careful historical and ethnographic approaches, each addresses relationships between the form of the nonhuman environment and the composition of social life. Each notes how certain aspects of urban nature are socially valued, while others may be deemed disposable. Our contributors ask, what socionatural, historical, and cultural logics underpin assessments of the forms of life that are permitted to live and thrive in the cities of the twenty-first century? The cases often show that human ideas and social agendas that galvanize around urban nature can mediate our understanding of precisely what, and who, is entitled to live and thrive in the city, and who or what is committed to social or species death.

It is our contention that across Asia, especially in crowded metropolitan centers, but also in smaller towns and at urban margins, the hazards, infirmities, and sources of vitality to be found in city landscapes are encountered and experienced differently across varied social groups. As cities respond to the degrading effects of urban development with ambitious greening projects, they may institute a second displacement or a double dispossession of the urban poor or migrants, whose livelihoods are often newly marginalized.

Nature in these settings returns in new ways to join assemblages of articulation in fresh struggles over rights to the city, even in forms we may not, at first, expect. For example, in the essay by Andrew Alan Johnson[25] in this volume, it is supernatural beings that haunt bridges, flyovers, and construction sites. These remind us that in alliance with those who suffer, submerged land and felled trees can author a moral critique of exclusive urban planning and prosperity. They may even do so in the form of ghosts, spirits, and locally powerful deities who need to be propitiated

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24. A fine example of such a search for resilience, comparing an Asian city (Chennai) and a European metropolis (London), can be found in Niranjana Ramesh's unpublished PhD thesis (2018).

25. See Andrew Alan Johnson, "Divine Excess: The Power of Accidents and Nature Spirits in Bangkok," chapter 1 in this volume.

by those who would benefit from the infrastructures that have been built by means of their destruction or displacement.[26]

A contribution to our collection by Tomonori Sugimoto[27] explores how rights to the city may be juxtaposed against greening projects that define classed and privileged access to urban common spaces in Taipei. Here, certain practices—in this case, the provisioning of food and shelter along riverbanks by indigenous Taiwanese—are rendered increasingly invisible and undesirable. Like the marginalized populations in Bangkok about whom Michael Herzfeld has written, Sugimoto shows how notions of entitlement to territory involve a complex bundle of political rights, moral prescriptions, and notions of ritual belonging among native Taiwanese.[28] Urban nature and a transforming underlying ecology are lively collaborators here, as the biophysical landscape is changed and cycles of ritual and meaning-making transform. This chapter nests the cycles of social and natural meaning-making in the shifting landscape of an ever-changing city.

In conversation with insights from Taipei in the chapter by Sugimoto, the chapter by Erik Harms[29] describes the contentious ecological histories of urbanization and the environment in Saigon. In this case, we are invited to trace cycles of ecological vitality and withering as wetlands, lakes, and other water bodies were submerged to create new city building stock. This chapter offers a unique window into the ways that an active public sphere made up of architects, activists, and planners worked to create and critique massive new urban zones in Saigon. As in Sugimoto's study, Harms' analysis highlights the ways that new environmental and social agendas brought fresh forms of social exclusion to the city landscape. The chapter shows how landscape changes that were broadly understood as ecological improvements activated new modalities of living, thriving, withering, and loss: fresh boundaries between people and changed mosaics of urban nature.

Turning to the ways that infrastructures animate the urban ecologies of cities, Harris Solomon[30] looks more closely at the life cycles of city infrastructure itself.[31] In a case from Mumbai, Solomon considers the seasonal, deadly, and often hidden holes that make up the city's topography of potholes. The city's pothole-ridden roadscape returns with frequent storms and floods, reminding us how ecological cycles as fundamental as water and weather can assume an active role in lived cycles of urban risk, accident, and injury. Through this case study, Solomon shows how

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26. For an example of such processes from south India, see Ishii (2017), which describes the worship of fierce gods and spirits angered and displaced by the construction of a major petrochemical complex and the development of a special economic zone in Mangalore.

27. See Tomonori Sugimoto, "The Death and Life of Urban Ecological Commons in Taipei," chapter 6 in this volume.

28. For an account of the struggle over a tiny enclave in old Bangkok, where poor residents mobilize claims of care and ritual belonging, see Herzfeld (2016).

29. See Erik Harms, "Concrete Ecology: Covering and Discovering Saigon's Ecology in a Time of Floods," chapter 8 in this volume.

30. See Harris Solomon, "The Absent Presence: Potholes in Urban India," chapter 5 in this volume.

31. An exemplary study of infrastructure and civic life in Mumbai is provided by Anand (2017).

seasonal floods and the potholes they entail can unleash a complex civic politics of urban nature.

If city floods draw our focus toward excessive rains, concrete, and impermeability, a contribution from Shubhra Gururani[32] offers contrast through her study of water that has disappeared. She considers the "embedded ecologies" of Gurgaon that no amount of planning and property-making can entirely erase. By describing the Ghata Jheel, an old lake in Gurugram, she shows how Gurgaon became a profoundly "unnatural" global city that lacks drainage, sewerage, and water supply. Invested as it is in business from knowledge industries and their attendant green imaginaries, the Gurugram in Gururani's analysis is hard pressed to present a vital ecology or a sustainable face.

Gururani uses this case in part to illuminate the hubris of development: planners expect to replace the complex web of natural and purposefully built water bodies with new, large lakes that are chiefly ornamental in purpose. Their prior function—enabling past urban settlement and agrarian practice—is almost entirely erased. In other contexts, cities in Asia have seen hasty and environmentally destructive development that has caused buildings to crumble on shaky wetland foundations. In this sense, wetlands can become polyvalent signifiers of ecologies of urbanism.

In an era of urban greening and growing environmentalist sentiment in cities, wetlands can simultaneously become targets for habitat conservation and sites for new urban sprawl, or locations for the displacement of the urban poor into resettlement colonies.[33] Across India, they embody the struggle for life and death in which nature in various forms is wrapped across cities. As Neha Sinha writes, "how India negotiates the distinction of wetlands—rather than homogenizing wetland as land, or protecting it only as forest—will set the tone for the future of wetlands in the country" (Sinha 2019, 152).

Turning to the death and life of urban nature in distress, a contribution from Kasia Paprocki[34] reminds us that contemporary cities are often also on the move—in this case, movement by ecological refugees. In her contribution, climate change is the main driver of policy and suffering in areas like the mangrove forested coastal villages of the Sunderbans in India and Bangladesh. By looking closely at climate adaptation regimes in these highly vulnerable and starkly poor areas, Paprocki problematizes the ways that evacuation has come to be the only sustainable and sensible response to climate change in the area. Paprocki's chapter illuminates how the weight of history, and a growing incapacity of states and international agencies to imagine a viable future for coastal rural areas, has real consequences for Khulna. It also turns our attention back to the importance of the scale of our analytical lens:

32. See Shubhra Gururani, "Making Land Out of Water: Ecologies of Urbanism, Property, and Loss," chapter 7 in this volume.

33. For a fine example of such processes, see Coelho and Raman (2013).

34. See Kasia Paprocki, "The Village at the End of the World: Ecologies of Urbanism in Climate Crisis Imaginaries," chapter 3 in this volume.

as localized experiences of climate change give way to new patterns of dislocation and migration, ideas and practices of nature-making—not to mention experiences of the loss of certain forms of nature—diffuse in new ways.

Paprocki's analysis invites this rendering of an ecology of urbanism into conversation with scholars such as Sunil Amrith, whose work reminds us that Asia, and particularly the eastern coastal edge of South Asia, is highly at risk because of its acute social inequalities. As he has written, "warming seas meet coastal zones that sag under the weight of growing cities, many of them founded as colonial ports in the eighteenth and nineteenth centuries. River deltas are sinking, starved of sediment by large dams upstream that were built in the 1950s and 1960s. We live with the unintended consequences," he writes, "of earlier generations' dreams and fears of water" (Amrith 2018, 5).

Another set of chapters elucidate projects of urban greening and the ways that benign and beautiful nature is invited back into the city or installed with renewed affection for experiences lost in industrial townships. In these cases, we are introduced to practices of gardening and farming, where sometimes rich legacies of urban gardens are recast as new projects of sustainable urbanism. At the risk of oversimplification, we might think of modern urban gardens as existing in two broad domains: public and private. The former, often manicured and heavily managed, tended to exhibit the features of botanical gardens that emerged out of the massive colonial exchange and study of flowering plants and trees that began in the early nineteenth century (S. Srinivas 2015, 57).[35]

Private gardens, on the other hand, were often less ornate and more functional but were crucial both to food provision and to the possibility for direct access to the natural world. Precolonial horticultural gardens in Bengaluru, for instance, were interspersed across the city, linked to water bodies like tanks and canals. They supplied fresh fruits, flowers, and vegetables. Today, their remnants appear in the form of nurseries and small vegetable gardens that feed urban residents. These are intermingled with other gardens that are associated with temples and shrines, which nourish the spirit and religious sentiments of modern city folk (S. Srinivas 2015, 52–64). However, public and private gardens were mutually imbricated in design, use, and aesthetic in many Asian cities as a legacy of colonial botanical gardens.[36]

In addition, many Asian cities are dotted with theme parks, civic parks, and what might be called accidental green spaces—including overgrown plots, unused land, and abandoned sites. There are also zoological parks in many Asian cities.[37] In many ways, earlier, modern Asian cities encountered urban nature as a spectacle, a playground, a food source, a symbol of spiritual power, and as a legitimizing source

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35. A longer history of these biotic transplants and exchanges can be found in several key studies including Crosby (2004); Schiebinger (2007); Schiebinger and Swan (2007).

36. For an elaboration of this point, see the article by Besky and Padwe (2016, 17–19).

37. For a fine study of an Asian city zoo, see Miller (2013).

for political authority. Many of these aspects remain true today, but contributions to this volume explore ways these are transforming.

For example, it is the notion of gardens and political authority that comes to the fore in the chapter by Annu Jalais.[38] Considering the case of Singapore, she asks: what does it mean to declare Singapore a garden city?[39] Even as the total city area under various kinds of green and open space shrank in Singapore in the last decades of the twentieth century, city dwellers became more engaged in nature conservation issues. The chapter considers several processes, including control and culling measures directed toward crows and cats, while at the same time urban development brings spectacular gardens and agricultural parks to life.

Others have considered the greening of Singapore a political project of an autocratic government, or a particular response to the anxieties caused by Anthropocene awareness (Heejin 2017; Schneider-Mayerson 2017). Jalais, on the other hand, shows the ways that government projects to establish specific kinds of urban nature are also educational and discipline initiatives enacted with the city's public in mind. A growing and diverse awareness of urban nature, which she tracks in part through exercises associated with a group of students she teaches, allows Jalais to demonstrate the inevitable escape of nature from within carefully curated gardens, even in a most orderly city like Singapore. A quest for a less regulated life joins, then, with plants, animals, birds, and young people, pondering the elegant fortress their island state creates.

Emergent socionatural relationships and new modes of political agency are also at the center of a contribution from Camille Frazier.[40] Using edible gardens as a site for consideration in Bengaluru, she shows how her interlocutors respond to concerns about food safety and health by cultivating their own organic terrace gardens. In this way urban nature, as a regenerative and sustaining force, is brought into the domestic sphere, affording quite direct experiences of the rhythms and seasons of growing plants and vegetables. Families provide labor and coordination; this extends to both cooperation and conflict with neighbors. Frazier argues that direct farming in apartments creates new conditions to embrace a lively and life-giving nature in a context where the death of nature threatens the life of the city at large.

A third case explores issues of cultivation in urban nature through a detailed study of a specialty organic restaurant and its foodshed in Hangzhou, China. Here, Caroline Merrifield[41] considers food safety scares and environmental movements that advocate for more sustainable food production and consumption in the city.

38. See Annu Jalais, "The Singapore 'Garden City': The Death and Life of Nature in an Asian City," chapter 4 in this volume.

39. There is a considerable literature on the development of Singapore as a garden city. For some notable examples, see Ho, Woon, and Ramdas (2013); key cartographic and other history considered by de Koninck (2008) and de Koninck (2017) provide a record of the physical transformation and urbanization of Singapore Island.

40. See Camille Frazier, "Putting the Garden Back: Cultivating Life through Urban Gardening in India," chapter 2 in this volume.

41. See Caroline Merrifield, "Keeping Pace with the Foodshed in Hangzhou," chapter 9 in this volume.

In this case, organic food production and marketing serve as modes for providing a social experience of connection to producers who, in the past, were obscured by previous norms of processing, packaging, and retailing food. Merrifield's case details the complex interplay of food production cultures and the logics of specific food preferences in Hangzhou; this affords a broader commentary on the ways that intimacy with agrarian environments becomes a means to embody and nourish ecologies of urbanism, and to construct a positive, generative view of urban nature in China.

Considered together, the cases assembled in this volume offer a robust and dynamic account of urban nature, across the entire continuum that spans the death and return to life of nature. They provide grounds for our collective assertion that while displacement and extinction signify the death of nature in urban environments, cycles of life are not entirely broken. Rather, they are often re-organized in careful interplay with transforming social conceptualizations of what belongs, and doesn't belong, in the socionatural complex that is the twenty-first century Asian city. Diverse forms of urban nature can and do return to cities uninvited, but cases offered here remind us that they also return through complex social acts of solicitation, invitation, and ideas of communion and replenishment. Such ecologies of urbanism are always in motion across Asian cities, large and small.

When understood as multiple and nested urban natures, the analytical approach our contributors take provides a fuller sense of how sociocultural realms of ethics, aesthetics, and inhabitation—human and nonhuman—figure powerfully in city ecologies. It is here, after all, in the multiple and multivalent assemblages through which urbanism may be "greened" or made more sustainable, that the aesthetic and moral universes in which urbanism emerges also encompass social ideas about meaningful and vital life. Our hope in this collection is that each case amplifies how the twenty-first century Asian city environment can encompass both life and afterlife in the face of new social pressures and expectations. In this sense, the death of nature just might also occasion new imaginaries of lively and life-giving nature *in* and *for* the city.

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The Singapore "Garden City": The Death and Life of Nature in an Asian City

Annu Jalais

In 2019, Singapore fêted its bicentennial "founding" in 1819, and in 2020, fifty-five years as an independent nation. Over the last fifty-five years, this city-state has become increasingly urbanized and wealthy[1] and now has one of the world's densest populations at nearly 8,000 people per square kilometer.[2] It has essentially very few farmlands left. The main primeval vegetation type of Singapore is lowland evergreen rain forest, which originally occupied about 82 percent of the land area, with mangrove and freshwater swamp forests constituting the remainder (Corlett 1991). With the intensification of land development, primary and tall secondary forests dwindled to about 1,700 hectares while built-up areas accounted for about 50 percent of the land area in the late 1980s; this has remained more or less the same to this day (Yee et al. 2011). What remains incredible is how alongside these built-up areas, attention is paid to keeping the place green, which in the context of Singapore is literal; in that this "green" space signifies an assortment of trees and grassy patches along highways, urban well-maintained parks and golf courses.[3] Singapore, the "Garden City," has been a longstanding trope used by government officials to promote tourism and actively entice the world's cosmopolitan well-heeled and moneyed to come to work or settle in the small cityscape. This "green space" sales pitch has also been used to attract tourists. It has been so successful that the Singapore Tourist Promotion Board (STPB), as early as 1987, awarded its

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1. "Between 1965 and 2013, the city-state achieved a 1,356 percent in real GDP (gross domestic product) per capita growth compared to 146 percent for the world and 96 percent for the United States for the same period" (Savage 2019, 2).

2. According to the statistics portal Statista, the 2016 population density of Singapore was 7,909 people per square kilometer (https://www.statista.com/statistics/778525/singapore-population-density/). This makes Singapore the third most densely populated country in the world (though not one of the most densely populated cities in the world). Of Singapore's 5.5 million population in 2015, 69 percent or 3.8 million are Singaporean citizens and 31 percent or 2.16 million are permanent residents (530,000) and foreigners (1.63 million) residing in the city-state. Thus, close to one-third of Singapore's population comprises foreigners (Savage 2019, 2).

3. "The Building and Construction Authority hopes to have, by 2030, 80 percent of all buildings certified under the 'green mark' scheme. Since its inception in 2005, 2,500 buildings are 'green' in 2015, covering about 29 percent of Singapore's total gross floor area (GFA)" (Savage 2019, 6).

most prestigious tourism award to the Parks and Recreation Department (PRD)—
the department in charge of greening Singapore. This greenery was soon touted
as important not just to make Singapore a world-class city to attract tourists and
foreign investors but also "to lift up" the "spirits" of Singaporeans (K. Y. Lee 1995).
"Nature" in Singapore is seen as a resource "that can be shaped to economic and
national development objectives" (Yuen 1996, 968). Indeed, what strikes visitors to
this garden city is not just its cleanliness and orderliness but also its greenery. Many
of Singapore's roads are dotted with beautiful non-native rain trees and bougainvil-
lea. The city is home to one of the best zoos in the world: it has an impressive bird
park, there are numerous public parks, and now it offers a river safari with fish
species from all over the world. "Nature" in Singapore is a matter of complete gov-
ernmental control—a resource both in terms of economics to attract foreigners and
their investments as well as culture to lift the spirits of home-grown Singaporeans.

In their 2013 book *Ecologies of Urbanism in India*, Rademacher and
Sivaramakrishnan propose addressing "the interface between environmental change
and urban transformation" when making sense of specific Asian cities (2013, 9),
thus bringing in the much-needed cultural dimension to studies on cities. The ana-
lytic of urban ecologies, they suggestively argue, "assumes the presence of multiple,
simultaneous and overlapping representations of the urban nature-urban culture
interface" (2013, 11). In their pioneering 2017 book *Places of Nature in Ecologies of
Urbanism*, they went on to say that "unlike a singular ecology that might suggest
a unified experience of urban nature" they would like to "identify the multiple
forms of nature—in biophysical, cultural, and political terms—that have discern-
able impact on power relations and human social action" (2017, 3–4). In other
words, they stress the importance of the fact that urban ecologies are plural and that
acknowledging human social action in relation to these ecologies is important. For
this volume, the two authors have urged us to reimagine Asian cities particularly in
relation to ecological collapse, death, and destruction. In their concept note they
asked us to "rethink the mosaics of urban space" in relation to the themes of life and
death (Rademacher and Sivaramakrishnan, May 2017 concept note for the *Death
and Life of Nature in Asian Cities* workshop). In what ways, the authors ask, do Asian
cities balance entities such as parks, walkways, gardens, and playgrounds and make
sense of them in relation to both the actuality as well as the looming threat of the
collapse of climate? The key issues they raise, and arguments they advance, are that
the biophysical conditions of urban Asian cities and their histories matter, including
the colonial legacies that have been woven into the urban landscape. They suggest
that to understand cities, especially Asian cities, one has to start "with processes, not
borders" (Rademacher and Sivaramakrishnan,[4] this volume, Introduction).

This chapter will argue that in the context of the city-state of Singapore, to
be able to make sense of "the interface between environmental change and urban

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4. See Rademacher and Sivaramakrishnan, "Introduction: Urban Nature Brought to Life in an Age of Loss," in
this volume.

transformation" as Rademacher and Sivaramakrishnan ask above (2013, 9), one needs to look at how Singapore's urban nature has been made to navigate through its urban culture and what the city's transformation has meant for its citizens. In other words, what *nature* might mean in this ecology of urban predictability that is Singapore has to do with a certain understanding of the urban culture of Singapore's near-total urban population. This cultivated culture of urbanity, one could argue, goes hand in hand with the ideology of "land scarcity," something that the government promoted since Singapore's status as a sovereign state in 1965. The ruling party of Singapore, the People's Action Party (PAP) government, increased its ownership over land via the Land Acquisition Act in 1966. From the government owning roughly one-third in the 1950s, the PAP government today owns 90 percent of the land; it has justified this land grab on the grounds that "the larger interest of the community must take precedence over the rights of the individual" (Ngiam 2007). The rhetoric of "smallness" and "urban," which was crucial to the postcolonial developmental state's intensified internal territorialisation (Bryant 1998, 36), has not really changed today, especially when Singapore is still referred to as "the little red dot" by its citizens. Indeed, Singapore's public and academic discourse on its own identity playing along the themes of *small* and *urban* perpetuates a political discourse of "survival" and "land scarcity" even after "relative affluence has been achieved" (Goh 2001, 25). Now nearly twenty years after Goh's argument, the discourse might have somewhat changed with the beautiful nature reserves like the Bukit Timah Nature Reserve, the Central Catchment Nature Reserve, and the Sungei Buloh Wetlands gaining traction; however, the impetus for the eradication of natural landscapes by developmental projects is still seen as necessary by the state, and the old Chinese graveyard Bukit Brown Cemetery's significant biodiversity has come under considerable threat, for example, with the government recently allowing a multilane highway through it. As a result, green spaces including both nature areas and gardened parks shrunk from 1.96 hectare per 1,000 persons in 1978 to 0.61 hectare in 1993. Even though in the past decade there has been talk by the Urban Redevelopment Authority (URA) of increasing the greenery of the city to 0.8 hectare per 1,000 population, this has not happened; the government promises to do so by 2030.[5]

Interestingly, however, what has also simultaneously occurred is a kind of perennial conflict between the idea of "development" and the idea of "culture" over nature between government and citizens as revealed in both groups' quest to use nature to reclaim a certain Singaporean cultural identity. Goh argues that the dominant developmental ideologies encompassing governmental discourses were "never completely hegemonic," because the greening of urbanscapes underscored "a fragment of nature in everyday consciousness" and has served "as reminder to the population of another reality far more complex, rich and mysterious than the

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5. "Designing Our City: Planning for a Sustainable Singapore," https://www.ura.gov.sg/services/download_file. aspx?f=%7B7DFC7DB9-335D-4A12-A072-9C3257269988%7D. Page 17. Accessed October 15, 2019.

urban" (Goh 2001, 14). But I believe that this idea of nature in the context of the Singaporean public also allows a counterargument to governmental notions of nature.

I am going to explore discussions around what nature might represent through a mix of historical and ethnographical methods to highlight internal contradictions about how life or death was viewed in relation to the greening of the city, farms, fishing, and the culling of certain nonhumans—all understood under the umbrella term of "nature"—in this city-scape. Questions discussed in both large and small student groups in the classes I taught while based at the National University of Singapore revolved around what nature might mean for the young in the context of Singapore's urbanity. What was interesting was how these conversations led to reflections on the importance of having a clean and orderly city,[6] and this included discussions on what "live nature" and "dead nature" might mean. Both online and offline, despite an avowedly modern and clinical approach to their cityscape, Singaporeans seemed to be decidedly divided when discussing nature and by extension the place of the "non-human"[7] in the city. My field notes are based on conversations with students who were taking my "Beasts, People, Wild Environments" course and about a dozen citizens with whom I had random conversations in places like supermarkets, food courts, farms, and social media. As of June 2017, the ethnic composition of Singapore is 74.3 percent Chinese, 13.4 percent Malays, 9 percent Indians, and 3.2 percent others, and I would say this reflected the ethnicity of the 2018 class of eighty-nine students taking "Beasts, People, Wild Environments." I consider the kinds of ethical debates that arose in contemplating the place of nature and nonhumans in Singapore in conditions where both greening and infrastructural efficiency are state-sponsored goals in a context of both urban development and urban beautification. Questions around what was meant by the "life" or "death" of nature and nonhumans soon became the emerging themes of these conversations.

As Rademacher and Sivaramakrishnan argue in their introduction to this workshop, *Ecologies and Urbanism in Asia III: Death and Life of Nature in Asian*

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6. I am not trying to argue it is not. There have been both similar culling as well as spontaneous culling in many parts of the world, such as the massacre of cats by apprentice printers in mid-eighteenth-century France as described by Darnton (1984) or the more recent culling of crows in Yemen's Aden, and that of pigeons in most European and many northern American cities.

7. Following anthropologists such as Viveiros de Castro (1996; 2004), Descola (1996; 2008; 2013) and Bird-David (1999), who have studied the intimate relations humans from various cultures have shared with animals and described how certain cultures' perceptions of "animals" do not fit the Western essentializing dichotomy between the two, I prefer using the term *nonhuman* for animals. I believe this term allows me to include understandings or "ontologies" of "animals" that are not necessarily steeped in the Western nature/society divide, thus allowing for a greater interweaving of an ensemble of socio-animal-natural relations; these have been explained and/or developed more independently by scholars such as Viveiros de Castro (2004), Latour (2004a, 2004b, 2009), and Stengers (2005) and have been at the heart of a few detailed anthropological studies between human and nonhuman animals, such as those of Jalais (2008, 2010, 2018), Willerslev (2007), Govindrajan (2018), Sangma (2016), Sur (2019), and others. They have more recently been at the heart of studies on ethics and social life in South Asia (Sivaramakrishnan 2015) and it offers a broader interpretation than what the term "animal" (a term deeply ensconced within the Judeo-Christian frame) might mean.

9

Keeping Pace with the Foodshed in Hangzhou

Caroline Merrifield

The small side road, marked with a sign commemorating the Qianlong Emperor's travels, leads to a stone-paved parking lot bracketed by a stone wall, a moon gate in the center. On the other side is a garden with jewel-box pavilions set amidst manicured trees and water features, traced with a winding path. These are the grounds of the Grange, a chic farm-to-table restaurant in the scenic West Lake District of Hangzhou, the capital of Zhejiang Province. Each pavilion room holds a single table; the restaurant hosts a maximum of ten parties at each lunch and dinner service. All the menus are prix fixe, tailored to the availability of particular ingredients on a particular day, to the number of diners in each party, and to the price bracket set by the host of the meal.

The Grange is a small restaurant, reckoning by the number of customers it serves; but each meal is the product of a large and complex backstage operation. The restaurant staff includes five full-time procurement agents who drive between the Grange and Hangzhou's outlying farming areas each day to purchase fresh, seasonal products. Every ingredient used in the restaurant's kitchens is purchased directly from a smallholder farmer or artisan producer—everything from the chickens and greens and peaches to the soy sauce and pickles and vinegar. The restaurant opened to the public in 2004. At the time, questions of food safety and "sustainability" (生态) were not subjects of public debate and concern in the way they are today. The owner of the restaurant, A Dai, says that he started the Grange as a matter of taste. He wanted to serve dishes with flavors he remembered from childhood, from his grandmother's cooking. To accomplish this he found that he needed to source directly from rural producers using "traditional" production methods. At the Grange, "tradition" is shorthand for a range of long-practiced regional techniques: the use of composts instead of synthetic fertilizers; the cultivation of heritage varieties; hand plowing; intercropping and multicropping; foraging; pickling; drying; fermenting.

Over the years, the Grange has developed a sophisticated supply system. A Dai's maternal uncle—called "Uncle" by the entire staff—is the head of procurement. He

is also the key initiator and maintainer of relationships with farmer-suppliers in the restaurant's network, work he describes as "building roads and bridges." Uncle estimates that he has been in contact with several thousand suppliers over the years; I estimate that several hundred are currently active in the restaurant's network. Uncle also coordinates the work of the other procurement agents. Brother Ming is primarily responsible for purchasing poultry and eggs at procurement stops across the northern and western parts of Hangzhou's Yuhang District. Baldy, who lives on the eastern side of the city, travels a dense daily circuit in eastern Yuhang, where he buys fresh fish and vegetables. Mister Huang has a few dedicated stops farther out from the city, in different directions, for fish, bamboo shoots, and craft food products like tofu skin. Wei, the youngest, and the most recent hire, covers the gaps between the others' routes. Uncle himself mostly undertakes "specialty" procurement, obtaining the unusual varieties and intensely seasonal ingredients that are purchased only once, or a few times, each year.

During my research at the Grange, I served as Uncle's informal apprentice and a junior member of the procurement team. As I followed these men on their daily routes, crisscrossing the countryside, I learned that the restaurant's supply system is poised on the edge of a coming crisis. As the city expands, agrarian spaces are pushed to a greater distance; and the future of the fresh ingredients the restaurant relies on is increasingly called into question.

Into the Foodshed

Uncle tells the story like this. For instance, we might be driving to a village in Yuhang District, to the north and west of the central city. We leave the restaurant, the green hills ridged in tea fields, and follow the roads out and around the lake, up to the older residential areas near the Zhejiang University campus, where the street sides are packed with small storefronts. Further out, the streets become progressively less dense, and the high-rises are newer and higher. We pass Xixi Wetlands on the left. *There used to be families, whole villages, in the wetlands*, Uncle says. Before it was a national tourist destination, it was one of the areas where he made his earliest procurement trips. The people were all relocated. Right in there he had a fish supplier; over there was a family that supplied him with eggs and vegetables. He lost contact when they moved. *I remember where everything used to be*, he says. *I remember all the changes*. The wetlands are barely twenty minutes away from the restaurant, depending on traffic. These days, the closest regular procurement spots, stops on Brother Ming's and Baldy's daily routes, are at least another twenty minutes out.

Whenever we go on a drive, Uncle gives a running commentary on the places we pass through. He has one mental map of presences: in this village there are crabs to be bought, and in that village a couple raises pigs, and in another there's an orchard with an heirloom variety of honey peach. He narrates a second map of absences. Where I see new property development, wide roads, and standardized city

greenification projects, he sees vanished crops, earthen farmhouses, fishponds, and livestock. The city has been moving, first patchily and then more and more densely, into one of China's richest farming regions (cf. An et al. 2018). Homes and villages join Uncle's register of absences; but so do old varieties and breeds, with their particular flavors and quirks, and plots of planted land, with their particular soils and microclimates. "Peasants" are transformed into "non-peasants" as rural residents exchange their rights to village land for urban residency status; and rural land is administratively transformed into city land, clearing the way for ever-intensifying "development" (Qian 2008).

In their daily journeys, the Grange procurement agents trace out the shape of a region that extends north, into Jiangsu Province; east, to Ningbo City; west, to Jiangxi Province; and south, to Fuzhou. Their accustomed routes take them through Hangzhou's outlying districts and counties, and to areas administered by the neighboring cities of Shaoxing, Huzhou, and Jiaxing. The region defined through the procurers' journeys is both cultural and ecological, encompassing traditional locales of production for the seasonal components of traditional Hangzhou cuisine. I use the word "region" in the sense suggested by K. Sivaramakrishnan and Arun Agrawal in their volume *Regional Modernities* (2003). Region "has a spatial connotation," like "local" and "global,"

> but it seeks to map the space between these binary polar extremes, refuses attempts at identifying it with a specific scale or geographic size, and focuses instead on the need to attend to the social networks and flows that give it particular form and content. (2003, 13)

I term the region defined by procurement a foodshed, borrowing a well-established usage in sustainable food systems scholarship and activism (cf. Horst and Gaolach 2014). The word "foodshed," a play on "watershed," was coined by W. P. Hedden in his 1929 book *How Great Cities Are Fed*. In a now-classic article, published nearly seventy years later, authors Kloppenburg, Hendrickson, and Stevenson (1996) argue for the revival of the term:

> How better to grasp the shape and the unity of something as complex as a food system than to graphically imagine the flow of food into a particular place? . . . [T]he replacement of "water" with "food" does something very important: it connects the cultural ("food") to the natural (". . . shed"). The term "foodshed". . . starts from a premise of the unity of place and people, of nature and society. (1996, 34)

In short: the "flow" of foods is shaped by uneven features of ecological and social terrain alike. Although "foodshed" is now often used simply to mean "the geographic area from which a population derives its food supply" (cf. Peters et al. 2008), Kloppenburg, Hendrickson, and Stevenson adopt the term for its normative punch. From their standpoint in Madison, Wisconsin, in the late 1990s, they see a system increasingly dominated by transnational corporations and industrial agriculture. They caution the reader that such a system will "restructure this marvelously diverse

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