The Routledge Handbook of Sustainable Cities and Landscapes in The Pacific Rim

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Chapter 1

Sustainable cities and landscapes

Cultivating infrastructures of health

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SUSTAINABLE CITIES AND LANDSCAPES

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Introduction

The creation of sustainable cities and landscapes is a central challenge of the twenty-first century. While theories and principles are emerging in the pursuit of a sustainable future, much of the practice aimed for such a prospect remains experimental and ad hoc in nature. To bring about desired outcomes and avoid unintended consequences, actions should be grounded in a better understanding of how cities and landscapes work, a clearer articulation of goals and visions, and more critical assessment of existing efforts. The long-term success of these actions necessarily relies upon systems of mutual learning and co-production based on place-based investigation that informs global health equity, climate stability, and decolonized spatial development (Agyeman, 2013; Barry & Agyeman, 2020; Ratima et al., 2019). The Pacific Rim, where the "Ring of Fire" denotes widespread geological instability and uneven urbanization demands locally sensitive solutions, is a macrocosm of the challenges facing regions around the world. Matching global goals with local context is essential, so that innovation is both place-based and widely useful.

The Pacific Rim must be at the forefront of any global progress toward sustainable development. The region includes parts of four continents (Asia, Australia/Oceania, Latin America, North America) abutting the Pacific Ocean, as well as the islands within (see Figure 1.1). It is home to more than 40% of the world population from close to 50 countries and regions of diverse cultural, economic, and political contexts. The Pacific Rim is a global space of ongoing flows and circulations of people, cultures, and norms; it is an economic juggernaut, through globalization of trade and patterns of production and consumption; and it is the world's central political field, with global military power concentrated at several points around its perimeter (Douglass, 1998; Olds, 2001; Ong, 1999; Smith, 1989). An uneven economic growth has persisted in this region with growth now slowing in heavily urbanized areas and accelerating in urbanizing parts. In 2018, North America was the most urbanized region in the world, although the urbanization rate has declined over the last two decades; and Asia is expected to have the fastest rate of urbanization and to house the world's most populous metropolises by 2050, while also having the largest overall number of people living in poverty (UNDESA, 2019). Despite the striking differences in their sizes, political and economic structures, and stages of urbanization, all geographies in this region

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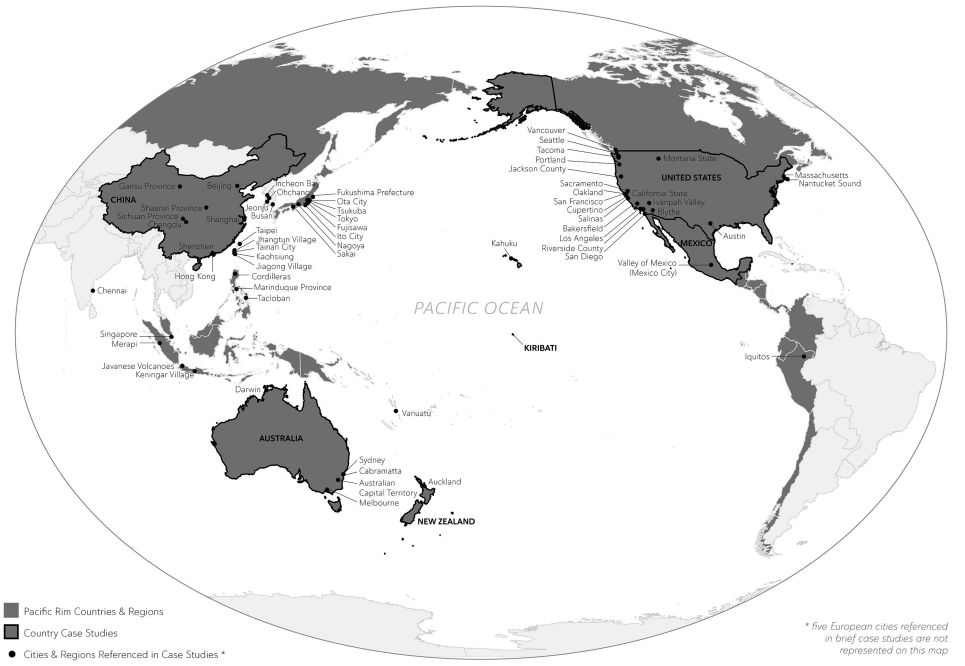

Figure 1.1 A map of the Pacific Rim and distribution of cases studied in the handbook

face common issues of climate change, disaster risk, and rising inequalities (United Nations, 2019). Adopting meaningful planning and policy actions to deal with these issues depends on our collective capacity to know, comprehend, analyze, and solve them. Improvement of this capacity requires and benefits from sharing information, innovation, and insights from cities and regions in the Pacific Rim, which has motivated the materialization of this volume.

Before presenting an overview of the book content, we acknowledge that our temporal, geographical, and cultural positions shape our understanding of what sustainable development means for cities and landscapes. The moment in history that we are living into and through, where climate change and a global pandemic further discipline our interpretation of world and local conditions, leads us to concepts of *health*, *infrastructure*, and *cultivation* to correspond with *why*, *what*, and *how* sustainable development policies and planning practices can contribute to making cities and landscapes resilient, equitable, and caring. We elaborate these concepts below to foreground their significance in helping us frame and structure this book into three main components: (1) why we need sustainable cities and landscapes (health), (2) what underlying systems support, maintain, and strengthen them (infrastructures), and (3) how we build capacity to sustain equitable growth and social-ecological resilience (cultivation).

Situating sustainable development policy and planning practice: why, what, how

WHY: health

Universals are notoriously hard to pin down. Sustainability, justice, innovation, love, well-being: globally, these are pervasive and honored concepts; yet in the practices, traditions,

expectations, and ways of knowing that characterize actual places, they manifest differently. "Health" is an important concept for global sustainability and urban development because so many of the behaviors and interactions realized in spaces bear directly on the mortality and well-being of humans and other species (Hodson, 2016; National Academies of Sciences, Engineering, and Medicine et al., 2016; Stimson, 2013). As an organizing universal, "health" also leaves itself open to various interpretive moves; yet, two aspects of its definition show real traction and promise for the policy and practice of sustainable development.

First, health can be conceptualized through an easily recognizable and measurable set of characteristics. Bio-function provides some degree of clarity around what sustainability looks like, or at any rate reasonably reliable proxy measures for what it might mean for different organisms and systems and how it can be supported, protected, enabled, and enjoyed. Understandings of species and habitat health inform practices such as adaptive management and ecosystem services, with sophisticated, evidence-based approaches for plant and animal communities experiencing different phases or challenges. Humans who are in stages of rapid brain development, or reproducing offspring, or recovering from disease, or immunocompromised require particular conditions in order to survive and thrive. An ecology that supports health will be one that recognizes, delimits, and nourishes the sources of metabolic and cell-renewing energy for organisms within it. For humans, this may involve complex choices and trade-offs, which is a different constraint than the presence or absence of empirical knowledge that permits such prioritizations. Managing for health may be one of the most profoundly human pursuits we are designed to undertake, for ourselves and in coordination with others (Lee, 2014; Nunes et al., 2016; Petrini, 2010). If a frequent and merited critique of the sustainability movement is its lack of substantive heft ("Sustainability of what? Whose values? Which power dynamics? Why?") (Littig & Griessler, 2005; Long, 2014; While et al., 2004), then the centering of health as an outcome to be sustained helps provide tangible ways of defining what is needed, for whom, and why. Critically, it puts front and center the understanding that human health relies on symbiotic relationships with non-human species.

Second, perhaps counterintuitively but crucially for the social ecology of urbanizing regions around the Pacific Rim, health permits a broad understanding of its drivers and causal pathways (Grzywacz & Fuqua, 2000; Stokols, 1996). Public health has moved decisively in the direction of acknowledging the social determinants, environmental conditions, and community mechanisms impacting individuals' medical status, physical vitality, and overall longevity (Corburn, 2017; Schulz & Northridge, 2004). Embraced by the World Health Organization as the "non-medical factors that influence health outcomes", social determinants of health include economic status, education, nutrition, shelter, interpersonal relationships, and access to basic amenities (Marmot et al., 2008; WHO, 2013). Importantly, inclusion and non-discrimination, as well as the absence of structural conflict are key components of healthy living conditions for human beings, connecting medical science and social science in our understanding of health outcomes. The natural and built environments shape experience, exposures, and resource availability for most people, making the physical support systems of cities and their surrounding landscapes central to the health of those who live there, and underpinning WHO's holistic and multifaceted approach to health through "healthy settings" (WHO, 1986). Distribution of opportunity and resources will affect who gets and remains healthy, and thus relates to broader goals of environmental justice and global equity. Sustainable development is conventionally constructed around the "three E's" of economy, environment, and equity; however, human health and health outcomes, as well as those of plants and animals within the systems where we share and depend upon resources,

provide a unifying focus that has somewhat eluded sustainability policy and practice over the last several decades (Friel et al., 2011; Kjellstrom & Mercado, 2008).

In the near future, we expect health promotion and health equity to take up larger roles in the political discourse and planning implementation of Sustainable Development Goals (SDGs) set by the United Nations in 2015. Since the cholera epidemic of the mid-nineteenth century led to the first collective reckoning in the US with the public interest in water and wastewater infrastructure, the intertwining of public health with urban planning and development has expanded to improving urban parks and green space, regulating urban land use through building and zoning codes, and more recently promoting more walkable places. At the current moment, scientifically unifying, and experientially integrating, global public health has perhaps never seemed quite as personally relevant, politically resonant, and generally ascendant in the public imagination as it does in the midst of a devastating worldwide pandemic. The COVID-19 illness caused by coronavirus infections killed over three million people, with some estimates between 7 and 13 million ("Counting the Dead", 2021) between December 2019 and May 2021 (roughly a year and a half).

Many of the conditions and capacities that sustainable development experts have been advocating for years – such as strong systems of governance and communication, safe and secure employment and housing, regionally efficient and functionally sufficient supply chains and distribution systems, and adequate public open space for outdoor gathering, recreation and exercise, psychological restoration, and urban environmental function – are the very investments that would have helped to limit the spread of this dangerous disease and ameliorate its effects. These imperatives of equitable development have gained a higher level of acceptability, thanks to the threat of widespread economic devastation and loss of life that are hallmarks of a global health crisis.

WHAT: infrastructures

Systems are the basis of sustainable cities and landscapes. These include built systems, such as those for water conveyance and treatment, and for mobility of people and goods; sociotechnical systems such as networks of communication and governance; and natural and landscape systems that support the environmental function and social needs of urban-rural regions. Taken together, such systems of interconnected space, energy, and activity organize the health of communities throughout the Pacific Rim and are the infrastructure of sustainable urban development. The role of infrastructure in regional and urban studies (Glass et al., 2019), in national and international policy contexts (Graham & Marvin, 2001), and in the lived experience of people moving through their daily lives (Amin, 2014) will understandably tend to focus on the large-scale, public works projects of ports, railways, power plants, highways, airports, sewers, bridges… the essential architecture of urbanization and industrialization (Gandy, 2014; Kaika, 2005; Schindler & Kanai, 2019). A unifying research interest of contributors to this volume is spatial; the infrastructures at the fore of our inquiries and analysis are physical and environmental, constructed or natural. The limited attention paid to non-physical infrastructures such as the systems of organizations and services is necessary, given the specializations of the involved disciplines and fields. While infrastructures are among the basic subjects in sustainable cities and landscape research, the processes of their creation, including research, constitute another type of infrastructure: information infrastructure. This fact elevates the importance of our work and heightens the responsibilities placed on researchers as infrastructure analysts, explorers, and builders (Taufen et al., forthcoming; Yang et al., forthcoming).

The engineered infrastructure of transportation mobility, energy provision, and resource management is rightly understood as critical to the functional sustainability of regions, both in maintaining the flow of goods and services that power our lives, and in improving the efficiency and equity of how natural capital is used and distributed, and with what impacts. The term "grey", while correctly describing the color of their building materials, often implies these infrastructures' unnaturalness and undesirable environmental impacts. However, these are important elements in regional human-nature relations, and dependence on necessary gray infrastructures intensifies with accelerated urbanization and rising threats from climate change, two unmistakable trends in the Pacific Rim. With this intensification, demand rises for efficiency, effectiveness, and equity in those infrastructures' delivery of services (see Section 5, Energy; and Section 8, Smart Cities). Innovation and investment in engineered infrastructures have the potential to significantly alter the global climate footprint, secure reliable conditions to achieve basic living standards for historically disadvantaged populations and regions, and improve economic opportunity for a broad range of trade and industry sectors.

Landscapes are also regional infrastructures, indispensable for all co-inhabiting species, human and non-human. These landscapes, ranging from large areas of unspoiled wilderness, to cultivated green spaces, productive urban gardens, and small planters of a green street, take a variety of forms across a full range of spatial scales. They encompass blue and green infrastructures, which, together with gray infrastructure, form the backbone of a region's basic supporting system. How these infrastructures are integrated and strategically laid out affects the possibility for us to achieve the "health" as broadly defined in the previous section (see Section 2, Food and Nutrition Security; and Section 7, Urban Design and Place Making). When established via environmental conservation and restoration, the blue and green infrastructures support efficient resource consumption and management (e.g. stormwater), protect and promote biodiversity, a critical indicator for ecological health, and minimize and mitigate human disturbance to the environment (see Section 3, Cities and Biodiversity; and Section 4, Water).

The health impacts on humans of green and blue infrastructures are profound for physical, social, and mental well-being (see Section 1, Vulnerable Communities; and Section 6, Green Space for Healthy Living). Through an equity and justice lens, however, it becomes clear that these infrastructures as they are currently distributed have contributed to environmental injustice, manifested in unequal access to benefits and disproportionate exposure to risks. Retrofitting and upgrading the old infrastructures to address problems, as well as building new ones that meet sustainability needs without making similar mistakes, relies on ecological and social science-driven processes for place-based and co-produced solutions (see Section 9, Co-production for Sustainable Development). We now turn to "cultivation" to explore those processes.

HOW: cultivation

In keeping with the relational aspects of infrastructure and health – the connectedness of spaces of urbanization and policy learning, and the social and environmental conditions that support human well-being – we hope to emulate and embrace the idea of cultivation, rather than more common sustainable development interventions through design, planning, and policymaking. All are important to our understanding of sustainable cities and landscapes, and evident in the sections and chapters that follow. As a handbook influenced by landscape ecology that engages shifting trends in urbanization and policy mobility, cultivation suggests a focus on two distinct, but interrelated aspects of sustainable development.

First, it is a metaphor of cooperative, rather than superimposed growth; one cultivates from the basis of what is already there, and one works with land, water, air, and spatial organization in ways that develop and grow from existing assets and sources of energy. Knowledge of climate, timing, pests, and conditions is essential, and requires an ongoing interaction between knowledge, power, trust, labor, and chance. Science shows us where conditions need care and support, and continual learning enables plants to establish and thrive. Making interventions to sow and reap successfully depends upon local knowledge and accumulated understanding from others, near and far. As with programs developed to match policy to context, acting with good intentions and invested stakeholders, we consider, evaluate, enlist, and implement available science. Cultivation requires a stance of humility, patience, inquiry, contact, and process; it is cultural as much as political. As any gardener or farmer knows, overconfidence is foolish. We get things wrong in the process of getting them right; adjusting our knowledge base to apply and integrate what we learn is what enables effective cultivation to be sustained in widely different and deeply limited and limiting contexts.

Second, cultivation as an interdisciplinary endeavor reminds us to seek out what we need, the knowledge or resource or group or input that can help to close a loop, grow the crop, bring a needed perspective, and improve the ratio of effort to yield. Cultivation is an argument for diversity, equity, and inclusion that is pragmatic and results-oriented, recognizing that policy knowledge is path-dependent and mutating, and in the same way that no amount of water is going to help a tree that needs fertilizer and sun, infrastructures that enable health and well-being will require more than design and engineering if they are to serve the populations that need them most, and conserve the natural systems on which they depend.

The implications of cultivation, as opposed to sustainable development plan creation, intervention, prescription, and formulation, constitute a qualitative shift that prepares global networks for the coming recalibration in an increasing multi-directionality of policy mobility. As a relational process, rather than delivery of a policy product, cultivation admits space for mutual learning and co-production that unseat the socio-cultural hegemonies of Western governance (Barry & Agyeman, 2020), and invite attention to multiple nodes of sustainable development potential, in practices that originate where growth and innovation are accelerating (Sletto & Vasudevan, 2021; Watson, 2014).

Reaching for SDGs: city-landscape connections, equitable development, and climate change

This handbook uses the three terms – health, infrastructure, and cultivation – to expand sustainability discourse and situate sustainable development as a place-based structuring around the needs and impacts experienced by people in city-regions. This is not the only distinctive quality of this book. Its sections and chapters exhibit focal and analytical consistencies around global goals. Adopting the following three themes lends this book intellectual and practical precision in its scholarly presentations of experiences, lessons, and insights derived from and/or applicable to communities and regions in the Pacific Rim: (1) the connection between cities and surrounding landscapes, across different boundaries and scales, as well as city and wilderness, built and natural environments; (2) the persistence of environmental and development inequities, and the potential for spatial design and institutional change to bring about more sustainable places; and (3) the growing impacts of global climate change, including how physical conditions are being anticipated and addressed. Furthermore, these themes and their associated challenges are at the core of addressing the SDGs set by the United Nations in 2015, and they animate each of the sections of this volume.

The SDGs have been characterized as the United Nations' invitation to the world "to dream" (Marmot & Bell, 2018). There are 17 goals, introduced with 169 targets to further the economic, social, and environmental health of all people around the world. The ambitious agenda for sustainable development (UN, 2015) speaks to a global recognition of the profound toll that industrialization and urbanization have taken on the earth, and the economic and gender disparities that persist, worldwide. The SDGs are formulated at the intersection of broad policy goals and global conditions, with deeply place-specific instantiations, and so advancing their potential and promise requires knowledge of a range of concepts and cases.

The three themes help localize many SDGs' manifestation and contextualize established pathways to their achievement. First, the connection between cities and surrounding landscapes is essential to sustainable development, across different boundaries and scales, as well as between city and wilderness, built and natural environments. Cities and human settlements do not exist separately from the non-urban places and landscapes that surround and support them. They are in most cases regionally and globally connected, with flows of people, ideas, goods, capital, and biophysical effects moving between and among different geographic, physical spaces. Thus, appropriate scale of intervention can be a moving target, based on changing conditions as well as available social, technical, political, and cultural mechanisms, in different contexts. Second, the persistence of environmental and development inequities, as well as the potential for spatial design and institutional change to bring about more sustainable places, is central to goals for improved development outcomes. Interventions to protect and manage the natural world, while broadening benefits to more people, will be essential to care for both people and planet. Third, the growing impacts of global climate change are being felt in cities and regions across the Pacific Rim. How physical conditions are anticipated and addressed, including the implications of sea level rise, altered agricultural cycles, extreme weather events, and changes to bioregional ecologies, must be at the forefront of our planning, design, and governance for long-term, sustainable urban development.

Overview of the handbook content

This handbook presents some of the key issues, concerns, and potentials for sustainable regions and city-landscape systems. Nine sections – 64 chapters, 129 authors – offer original research and practical analysis to inform the growing and urgent need for concerted, practical action to support sustainable development across all regions of the Pacific Rim. Scholars affiliated with the Association of the Pacific Rim Universities (APRU) Sustainable Cities and Landscapes (SCL) Hub (see Johnson and Ko, forthcoming),[1] for which there have been open calls over the last several years, comprise the majority of the contributors to this book. The section titles are not meant to be comprehensive in their representation of the challenges and opportunities of sustainability planning, design, and governance; rather, they represent approaches and organize frames through which additional, essential topics in the sustainable development of cities and landscapes (e.g. transportation, housing, employment) are engaged and addressed.

Sections are organized around concepts of *health*, *infrastructure*, and *cultivation* – corresponding to the *why*, *what*, and *how* questions fundamental to sustainable development policies and planning practices. The first three sections – vulnerability, food, biodiversity – address basic human needs and settlement conditions captured in "health". The next three – water, energy, landscapes for health – treat natural assets and constructed natural systems as part of "infrastructure". And the final three sections – urban design, smart cities, co-production – turn to the institutional investments and collective practices necessary for

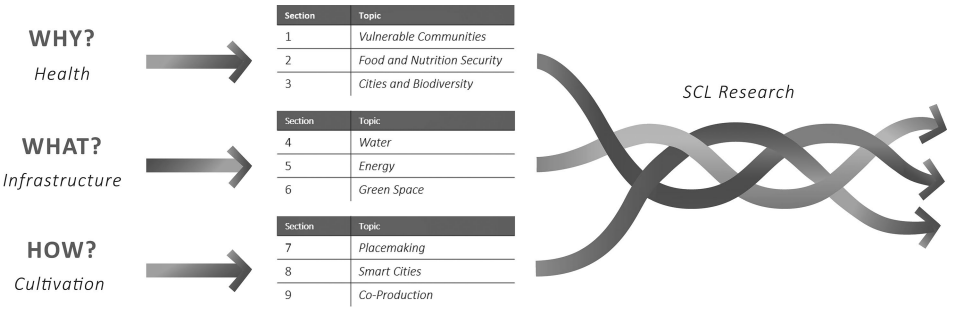

Figure 1.2 Structuring handbook content with concepts of health, infrastructure, and cultivation

"cultivation". Ultimately, these concepts come together and reinforce one another in sustainable places. As shown in Figure 1.2, research moves persistently forward, although not in a perfectly straight way. Research undertaken in this framework expects to eventually weave all three concepts together in implementation. The resulting braid draws on tradition and aspiration (Kimmerer, 2015) to achieve more sustainable cities and landscapes, foregrounding climate change and equitable development.

Vulnerable communities

Chingwen Cheng leads with a section on vulnerable communities, foregrounding the importance of climate justice for cities and landscapes of the Pacific Rim. After defining the concepts of climate vulnerability and community resilience on which the section is based, and describing its evolution over multiple collaborative gatherings, the section provides analysis and case studies of how communities are meeting the challenges of sea level rise, natural hazards, and extreme storm events. In chapters based on the Philippines, Thailand, Taiwan, and Indonesia, authors foreground accounts of community resilience, and emphasize justice implications of building community capacity to respond to environmental conditions.

Food and nutrition security

Food systems can provide ecosystem services, where biophysical processes meet human needs and replenish the larger whole. Too often agriculture creates unsustainable relationships between cities and hinterlands, regionally and globally. Robert Dyball brings together research to look at current and alternative nutrition provisioning systems across multiple scales, from the very local, including urban agriculture, to regional "food catchments", to national and international distribution systems, including "telecoupled" relationships between producers and consumers in distant places. Chapters highlight issues in justice, fairness, health, and environmental impacts, including the equity and security implications of adequately meeting the nutritional needs of rapidly urbanizing regions.

Cities and biodiversity

Urbanization exerts multiple influences on the surrounding natural world, eliciting responses from advocates and activists. Planner and political ecologist Jennifer Rae Pierce sets forth ways of understanding positive and negative impacts on biodiversity, including through land

use and restoration efforts, and social patterns of consumption and pollution. Impacts are discussed at a range of scales, from within the city itself, to the urban-rural interface within regions, to connections and exchanges with international landscapes. Chapters include cases and research from different sites, showing approaches to planning, outreach, measurement, and management that aim to conserve biodiversity in cities across the Pacific Rim.

Water

Water is critical to nearly all aspects of the United Nations SDGs, and assuring access to freshwater in sufficient quantity and acceptable quality is one of the greatest challenges for human populations in the twenty-first century. The need for water is universal, and its distribution and availability have shaped urban culture as well as histories of regional settlement and their development patterns. Urban ecologist and landscape designer Ken Yocom gathers research examining the cultural and material significance of water for cities and regions around the Pacific Rim, with an interdisciplinary perspective that connects individuals to place, supports communities, and drives political economies.

Renewable energy landscapes across the Pacific Rim

Development of renewable energy alternatives in response to human-induced climate change involves land use issues affecting regional landscapes. In this section, economist Makena Coffman and landscape architect Yekang Ko highlight conflicts and trade-offs in efforts to decarbonize power systems: habitats are disrupted, experiential landscapes are altered, and some communities are disproportionately impacted. New sectors promise economic development and also affect existing residents. Chapters emphasize siting and design to maximize co-benefits of renewable energy for multiple interests and stakeholder groups; and provide guidance on scoping and siting as essential to making socially and culturally just transitions to low-carbon renewable energy landscapes.

Green space for healthy living

Human health and well-being are place-based phenomena, influenced by environmental psychology, access to human services, and quality of the natural environment. Chun-Yen Chang and Puay Yok Tang bring together examples of landscapes that support the connection between healthy people and healthy environments, focusing on spatial composition and configuration, processes of nature, and connections between space and place. Drawing on applied research in Taiwan, and emphasizing work on restorative psychology, practical applications, and research gaps in landscape design, the section illustrates opportunities to improve human experience through interventions in the use, understanding, and simulation of urban open space.

Urban design and place making

The chapters in this section explore challenges and opportunities for achieving the goals of sustainable development through urban design. Paola Boarin and Linda Corkery foreground the shared, collective role of place making to address indicators and meet targets set forth by SDG 11 – Sustainable Cities and Communities and interconnected SDGs. The sites and projects are drawn from regions across the Pacific Rim, providing examples from different

physical, political, and socio-cultural settings, and emphasizing the power of design to address complex issues. Chapters in this section address green infrastructure from metropolitan to neighborhood scales, greening initiatives for cool public spaces to mitigate urban heat, the gap between predicted and actual environmental performances as well as resident satisfaction in a new model of compact residential density, the city-shaping potential of alternative energy technologies, and types of informal public spaces in high-density cities.

Smart sustainable cities

In this section, Mohsen Mohammadzadeh focuses on the concept of "smart city" and its implications; how the term is defined in different social, economic, and political contexts, and how the technologies are used. Chapters explore the Internet of Things (IoTs), Big Data, and Digital Twinning as capacities to better understand, manage, and develop urbanizing regions. Smart technologies can support transportation, waste and water management, power networks, and asset management and building services; and can be used to manage natural disasters, or to mitigate pollution via real-time monitoring natural and built environments.

Co-production for sustainable development

A place-based and ambitious approach to sustainable development requires the cultural sensitivity and institutional realism of co-production. In this section, Anne Taufen brings together chapters that explore the sources of regional identity, capacity for action, knowledge systems acknowledged and produced, and shared discourses that orient political action, in the planning and governance of specific projects and sites. Co-production as a model of engagement responds to conditions as they exist, rather than how we imagine or wish them to be, forging connections between urban and rural landscapes, anticipating and planning for climate change, and addressing patterns of social and spatial inequality.

Conclusion

Central to academic work, the research brought together here is one of several aspects of the ongoing co-learning of scholarship. Through inquiry, we are able to interpret and make sense of phenomena; and through encounter and interaction, we learn from events as they unfold, and from each other. This handbook matured alongside the experience of a global pandemic, and this crisis has heightened for us the urgency of better addressing the very topics we study. COVID-19 is but one of what are predicted to become more common and uncontained disruptions, throughout the Pacific Rim and globally. The imperative to get better at learning, and to allow ourselves to be shaped and taught by the painful experience of being caught out by a vector that was entirely predictable, and yet also unforeseen and disbelieved, is an object lesson in becoming better and more adept scholars, if we are able to take it.

The COVID-19 pandemic has reminded global elites of their profound vulnerability, an existential reality from which those with resources are more likely to be insulated. The conceit of abstraction – essential to scholarship – is a byproduct of privilege, where the immediacy of physical threat or bodily harm is sufficiently distant to permit study, analysis, reflection, and theorizing. This distance can become deadening; elegant conclusions are

disconnected from the conditions and experience of crisis, and the drive for intervention, action, improvement in the lives of people and communities persists as an idea, rather than a risk-laden reality.

The pandemic laid bare areas of sustainable development that are under-resourced, and deeply implicated in the ability of urbanized regions to respond to crisis. As noted above, networks of water, energy, and mobility infrastructure, as well as green and blue spaces of interconnected cities and landscapes, help regions respond to climate change and development inequities. Similarly, strong and reliable systems of governance, and resilient networks of people, places, and economic sectors are essential for disaster response. Lack of investment in these areas is more likely to affect people and communities already more at risk due to socio-economic status, and so will tend to amplify the disproportionate impact of these social determinants of health.

While we have known for some time that the earth's climate is warming and is able to model where and how those effects will be felt, learning about climate change as an abstract possibility as opposed to experiencing its effects first-hand has made it difficult to generate commitment to action. Importantly, each of the things noted above stands to help regions respond to climate-related events and disasters – as well as contribute to averting them, in the first place.

The overall goal of this handbook is to further the project of knowledge production for sustainable development. By conducting and sharing research through networks of communication and co-learning, we invest in the relationships and informational infrastructure that are necessary for experimentation and improvement in development practices. As the following two chapters explain, the characteristics of the SCL Hub and the nature of policy mobility are two sides of the same coin: the global space of the Pacific Rim as a distinct physical geography is constructed by the relational processes held in place by people and communities arrayed across its various regions. By enacting the SCL Hub as an educational network of researchers – for which this volume is one of multiple, and ongoing outcomes – we create connections of knowledge co-production, where the interests and claims of very different regional experiences take hold, and the understandings produced can enlist and respond to widely different social-ecological contexts.

Note

1 The Association of Pacific Rim Universities (APRU) is a consortium of about 60 leading research universities in regions across the Pacific Rim. The APRU strives to be the "Voice of Knowledge and Innovation" by leveraging "collective education and research capabilities of its member universities into the international public policy process" (APRU, n.d.). Housed in the University of Oregon, the Sustainable Cities and Landscape (SCL) Hub is an APRU initiative launched in 2016 to support transdisciplinary and synergistic collaboration in research and practices of sustainable urban and regional development. The SCL Hub now has 17 member universities and continues to expand its geographic representation. For more information, please see Johnson and Ko (Chapter 2 of this handbook).

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