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

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Chapter 2

The APRU Sustainable Cities and Landscapes Hub

A platform for collaborative knowledge production and action

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APRU Sustainable Cities and Landscapes Hub: who we are

The Sustainable Cities and Landscapes (SCL) Hub was established in 2016 to respond to mounting evidence that rapid urbanization, population growth, and climate change threaten the sustainability and resilience of cities and their surrounding landscapes worldwide. As of 2021, over 56% the world's human population of 7.9 billion people lives in cities. The World Bank projects a global population of ten billion by 2050 and, according to the United Nations, all future population growth will occur in urban areas as rural populations stabilize and begin to decline. Urbanization influences landscapes well beyond city boundaries through its demands for resources, and its impacts on factors as diverse as greenhouse gas (GHG) emissions, hydrological cycles, ecological processes, productive lands, and rural life. Urban sustainability and landscape sustainability thus go hand-in-hand, and it is not possible to understand either without understanding the interdependencies between cities and their surroundings.

The mission of the SCL Hub is to advance the sustainability of human and earth systems through co-production of knowledge that leads to actionable plans for enhancing supportive relationships between cities and their local and regional landscapes. The hub is hosted by the Association of Pacific Rim Universities (APRU), a network of 61 leading research universities from across the Asia-Pacific region. APRU researchers collaborate through strategic initiatives such as the SCL Hub to serve not only as educators and innovators but as agents of change who help solve pressing regional and global challenges. The SCL Hub is supported by a consortium of research universities from around the Pacific Rim, led by the University of Oregon. Established with a core group of 6 universities in 2016, it has grown to 19 universities as of 2021 and continues to expand its membership to represent the geopolitical, socioeconomic, cultural, and ecological diversity of the region (Figure 2.1).

Our approach: a city-landscape perspective for sustainability research

The following framework was generated by the authors at the initiation of the SCL Hub and it has served as a continued reminder of the "silos" that can form when disciplinary boundaries frame our conversations rather than a clear view of landscapes themselves. Even more

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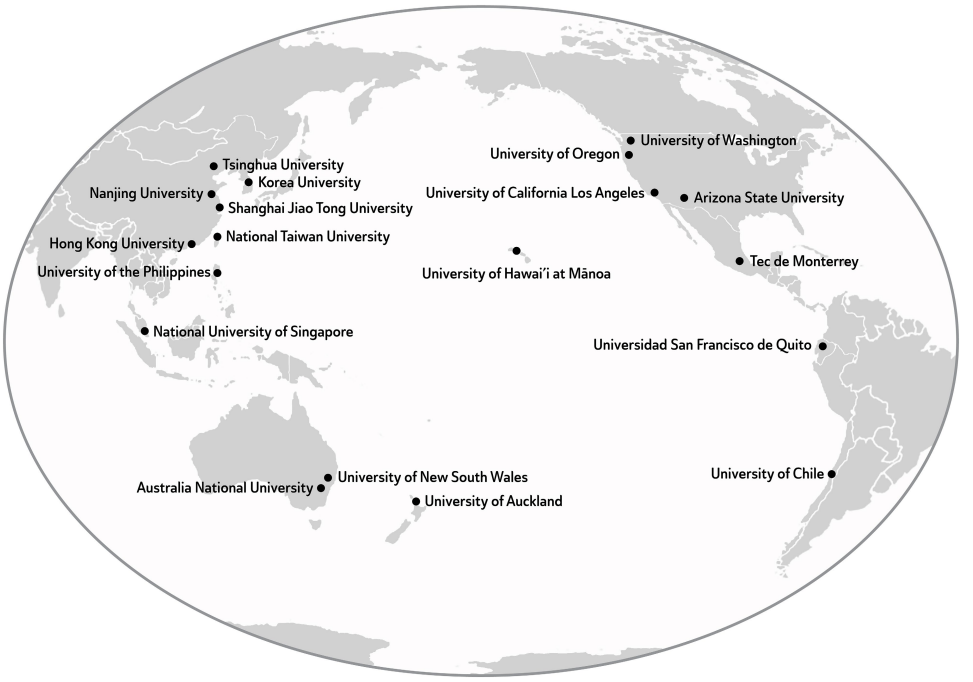

Figure 2.1 The member institutions of the APRU Sustainable Cities and Landscapes Hub

challenging has been to put into practice the assertion that cities are not separate from their surrounding landscapes despite the sharp boundaries demarcated in the landscape and, too frequently, in our thinking.

Cities draw from, contribute to, and impact their surrounding landscapes. As cities have grown, their relationships to local and regional landscapes have changed as well. Understanding and managing these interconnections is a key to solving many critical sustainability issues of the twenty-first century such as supplying adequate food, water, and energy while protecting vulnerable populations and ecosystems in the face of population growth and climate change.

Our investigations are driven by three core questions:

- What are the forces that shape the relationships between cities and their surrounding landscapes?
- In what ways do those relationships affect the long-term sustainability of cities, cultures, and ecosystems?
- How can people manage those relationships to enhance landscape-level sustainability, resilience, and adaptive capacity in the face of continued urban expansion due to demographic shifts and population growth, and the stressors of global change, particularly climate change?

We focus our investigations on four sets of processes: those internal to cities, those occurring within surrounding landscapes, those occurring across urban-rural boundaries, and finally, *telecoupling*—the transfer of goods and services that connect cities to distant landscapes and economies (Figure 2.2 a). Our primary focus is on how spatially situated processes connect cities and their local-to-regional landscapes socially, ecologically, and economically, thereby

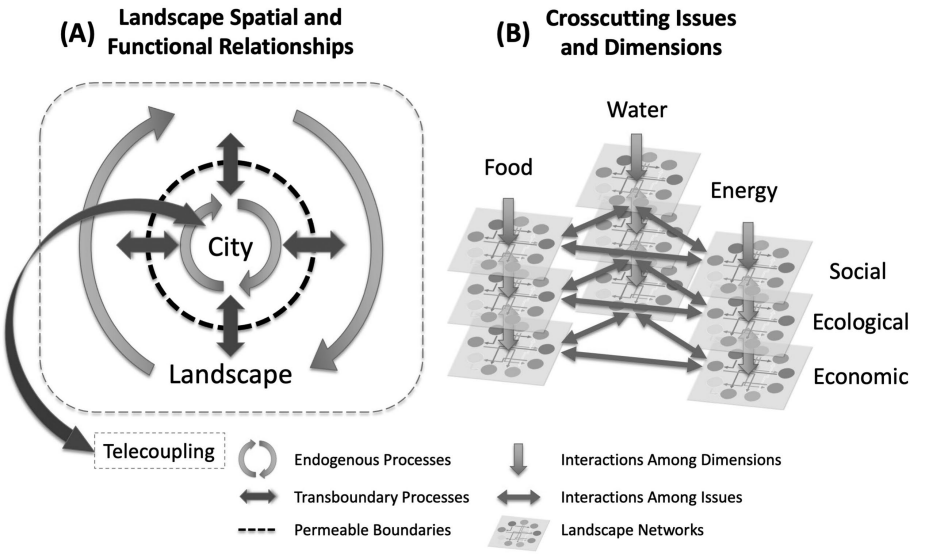

Figure 2.2 Sustainable cities and landscapes conceptual model. (a) The interactions between cities and their landscapes are characterized by internal processes and transboundary couplings at the urban–rural interface and beyond. (b) These processes and couplings represent spatially situated interactions among key productions, such as food, water, and energy, each with their own topologies of social, ecological, and economic networks

creating landscape complexes with substantial cross-scalar feedbacks that influence, and are influenced by, the topologies of sociocultural and biophysical networks (Figure 2.2 b).

We posit that dichotomous conceptualizations of "city" and "landscape" must be applied carefully to avoid artificial and inhibitory divisions of what in fact are continuums of landscape processes. We argue that management of the nexus between cities and their surrounding landscapes is central to many of the most pressing sustainability issues faced by societies, including the degree to which cities rely on resources transported from far away, the impacts of cities on regional ecosystems, and the degree to which connections to local and regional landscapes provide health, vitality, and a sense of place to urban residents.

Food, water, and energy exemplify the cross-scalar and interconnected social, ecological, and economic dimensions of sustainability. Traditionally, most food was produced locally or regionally and transported relatively short distances. For many cities and their residents, that picture has reversed with the rise of agribusiness and global food distribution. The telecoupling of food across long distances is a two-edged sword. It has increased certain economic efficiencies by matching the large-scale production of individual crops with the climates and soils to which they are best suited, bringing both staples and luxury items to consumers for less cost, and increasing year-round availability of fresh fruits and vegetables. It has also come at the cost of long-distance transport and associated carbon emissions. It has led to questions about the health of the food produced and the ecological and environmental impacts of agribusiness, spawning a growing organic agriculture movement as well as campaigns to support local agriculture, including food production within cities themselves. The reasons go beyond consuming healthy food and supporting local economies to encompass nuanced motivations such as restoring a sense of place, the sociality of downtown farmers' markets, and increasing the resiliency of urban food systems as part of disaster preparedness.

The locations and ways in which the food that feeds a city is produced have deep hydrological implications. Producing crops for local, regional, and global markets accounts for the vast majority of fresh water used by human societies. Simultaneously, people in cities need fresh water for drinking, washing, sewage systems, and industry. Water is essential for native ecosystems and their associated biodiversity, especially through dynamic river flow regimes and associated sediment transport. These processes, each a cornerstone of sustainability, can directly compete for available water, and the by-products of one use (e.g. pollution) can affect others (e.g. drinking water and habitat). Importantly, unpredictable disturbances such as floods are central to healthy ecosystems but can pose threats to human settlements and livelihoods. People's understandable proclivity to create stability in their environments has effects that ripple through entire regional landscapes, affecting not only biodiversity and the provision of important ecosystem services but often creating unintended feedbacks that increase risk (e.g. floods and wildfire), and reduce the very stability that was sought. Finally, although cities are located along discrete sections of rivers, hydrological processes propagate over long distances of the river continuum, and their management is further complicated by connections between surface water and ground water, and by the myriad ways in which land management across entire watersheds affects water quality and quantity, including river flow regimes.

The ways in which we produce food and supply water for urban populations require enormous amounts of energy, as do other consumptive uses concentrated in and around cities, including transportation, and residential, commercial and industrial activities. Globally, cities use three-quarters of all energy produced, and discharge a similar proportion of GHG emissions. Importantly, the sources of energy used and the ways to generate and distribute it significantly influence city-landscape relationships, and the socioeconomic and ecological impacts of energy use. Each energy source—coal, oil, nuclear, wind, solar, wave, and tidal power—comes with its own impacts. Each presents tradeoffs among factors such as GHG emissions, threats to terrestrial and marine ecosystems, risks of disasters, source impacts of extraction and production, health and justice impacts on vulnerable human populations, and complete life cycle costs. There are no simple solutions. A desired transition to net-zero energy emissions has produced unprecedented pressures on landscapes, as exemplified by the "energy sprawl" of large areas needed for solar and wind farms. Such renewable energy development has created land-use prioritization conflicts between wildlife habitat and rural communities. In response, there is an emerging emphasis on harvesting renewable energy from already-disturbed areas such as cities, agricultural lands, and brownfields in concert with technologies, policies, and urban design that combine distributed energy systems (e.g. solar cells on rooftops), conservation, and biological processing to reduce the demand for centralized energy production. For example, walkable, mixed-use neighborhoods combined with mass transit systems can reduce transportation costs and emissions, while improving the quality of urban life. Urban and peri-urban agriculture can provide healthy, local food with reduced energy for processing and transportation. Green infrastructures such as urban forests, green roofs, and stormwater biofiltration systems harness ecological mechanisms to conserve energy, and to cleanse and infiltrate urban runoff, thus protecting river and stream ecosystems and groundwater with greater adaptability and lower costs. Each of these solutions carries its own challenges of matching promises with performance, learning from experience, and hidden environmental and socioeconomic costs that may only emerge after implementation.

The management of interconnected and geographically situated processes—such as those associated with food, water, and energy—is thus a cornerstone of creating cities that are

sustainable, fulfilling, and just. At the same time, many key issues and attributes of such cities, for example, habitat and health, are only partially addressed through keystones such as food; water; and energy. The challenges are complex and fit the definition of *wicked problems* with no permanent solutions but only temporary resolutions. Yet, the potential to build enduring urban systems that better meet the long-term needs of people and ecosystems is clear. The principles, systems, and standards we establish in this time of global transformation could resonate for centuries to come.

SCL Hub structure and activities

To address these challenges, the SCL Hub is built around a set of five principles that guide its efforts and serve as touchstones to ensure that each initiative supports the hub's priorities in their totality. Working groups that convene at the hub's annual conferences are the primary means through which hub activities are sustained and renewed. The SCL International Steering Committee, consisting of representatives from each of its member institutions, meets quarterly to guide the hub's long-term research plan and associated activities, including establishing new initiatives.

Guiding principles

We want our work to be transformative

We are a research hub, but our inquiry is intended to produce on-the-ground change. This requires both intellectual leadership and the engagement of stakeholders, practitioners, business, government, and NGOs. Annual conferences and virtual activities serve as the platform for such engagement through plenary sessions and working groups. Moreover, since 2019, core SCL faculty have actively contributed to initiatives such as the Asia-Pacific Mayors Academy, partnering with UNESCAP and UN Habitat and other international organizations, and directly working with mayors to support accelerated city-level actions and peer-to-peer exchanges as a means to achieve the UN Sustainable Development Goals by 2030.

We have different understandings and contexts for sustainability

The hub provides an opportunity for us to explore these differences not only in conceptions of sustainability but in how their unique geopolitical context leads to different approaches and goals. We seek to understand common issues and their unique contexts and solutions. The SCL thematic working groups facilitate research collaboration and knowledge co-production through this multicultural approach, and produce place-based case studies and research outcomes as a path toward actionable knowledge.

We seek broad geopolitical representation across the Pacific Rim

This is geographic, cultural, socioeconomic, and ecological. We need this diversity to both craft the best local solutions and because, for sustainability to be achieved, it must be achieved globally. This means across cities; nations; and continents, as well as the ways that cities depend on each other. Since starting with six universities in 2016, the hub has grown to 19 core members with broad geopolitical diversity across the Pacific Rim. We are working

to strategically expand the network further, particularly in Southeast Asia, East Asia, and Central and South America.

We will address the needs of underrepresented communities and vulnerable populations

In particular, we want to contribute to alleviation of poverty and inequality within and among countries, with a particular focus on marginalized populations and places. Each conference has emphasized place-based approaches that address the needs of underrepresented communities and vulnerable populations. The 2018 conference's design field school in Eastern Java and Hong Kong allowed students to explore issues of modernization and its impact on different Southeast Asia cities and landscapes. The 2019 conference offered a student design competition around cities and refugees, and initiated an advocacy workshop to expand our global engagement, especially in supporting underrepresented communities. The 2020 virtual conference highlighted indigenous knowledge and wisdom for justice and accountability, and considered how our disciplines and professions can advocate for the voices and rights of indigenous people.

We recognize the climate crisis as a grand challenge for human societies and earth systems

Like many other organizations, the SCL Hub has identified climate change as the preeminent challenge of our times, impacting all other issues. In 2019, the hub put forward a *Declaration of Climate Emergency and Call to Action* that articulates the links between the work of the hub and the imperatives to mitigate and adapt to rapid climate change. In the declaration, we identify four key goals that, respectively, focus on the ecological foundations of life, the rights of future generations, climate justice, and cities embedded in landscapes (https://apru.org/apru-scl-program-hub-declaration-of-climate-emergency-and-call-to-action/).

Working groups

The APRU SCL Hub established a "working group" framework to produce actionable knowledge as an outcome of each annual conference, including dissemination through publication. By bringing together diverse participants across geopolitical regions, disciplines, and professions, the working groups aim to enhance local and regional agency by identifying broadly applicable strategies that are linked to core sustainability practices such as anticipatory planning, action-oriented design, and advocacy.

Working groups are the core of each conference. Rather than focusing on disseminating research that has already been completed, our conferences focus on collaboration among participants before, during, and after each meeting to build agendas for research and action that advance our common goals and guiding principles. Each working group comprises 5–20 individuals from member institutions and others who wish to participate. We harness the diversity of the hub's membership to explore the issues targeted by each working group, and then foster exchange and synthesis across working groups during the conference to build mutually supportive "connective tissue" that links the different themes toward a unified framework for city-landscape sustainability and resilience.

At the inaugural APRU SCL conference in Portland, Oregon (2017, University of Oregon), ten working groups focused on various issues of sustainable cities and landscapes; since

then, these working groups have continued to evolve in number and scope at each subsequent conference: Hong Kong (2018, Hong Kong University), Sydney (2019, University of New South Wales), and most recently a virtual conference in Auckland (2020, University of Auckland). This year, 2021, is the fifth anniversary of the hub's creation, a year of reflection on our development, and of strategic planning for the next five years. Although we will not meet in person due to COVID-19, many working groups are continuing their activities through webinars and other venues. The 2022 Conference is scheduled for Honolulu, hosted by the University of Hawai'i at Mānoa.

Sixteen working groups were hosted over the first four annual conferences. At each subsequent conference, some working groups have continued with renewed leadership, while new ones have emerged as they were proposed and initiated. Through pre-conference preparation and intensive conference work sessions followed by extensive refinement and development after each conference, most of the working groups listed below have contributed to the sections and chapters of this handbook.

- Children, youth, and environment
- City-landscape sustainability
- Food nutrition security
- Indigenous knowledge and wisdom
- Landscape and human health
- Productive landscapes and infrastructural ecology
- Renewable and future energy landscapes
- Smart cities
- Sustainable transportation
- Sustainable urban design
- Transitions in urban waterfront
- Urban and landscape biodiversity
- Urban waters
- Urban-rural linkages
- Vulnerable, resilient, and climate justice communities
- Water and sanitation

The topical breadth of these working groups, as well as the ways in which each has attended to our five guiding principles in the context of cities and their regional landscapes represents the most definitive expression to date of the SCL Hub's vision for the future.

Concluding thoughts on collaborative knowledge production and action

The SCL Hub is now five years old. After four successful conferences, we have seen that the working group strategy produces fruit from new collaborations. Most conference participants have reported that the opportunity to work with colleagues toward focused goals rather than simply listening to presentations is one of the most successful aspects of our approach. Meanwhile, the International Steering Committee sustains the growth and innovation of the hub through a form of distributed leadership that has emerged from new initiatives launched by the organizers of each annual conference. One of the priorities identified by the steering committee is to build bridges from academia to those working in practice and governance. This work is in its early stages but growing through efforts such as the United Nations

Asia-Pacific Mayor's Academy, initiatives to establish institutional links to global partners, and local efforts of advocacy and outreach. Hub membership is growing, with interest from new APRU member universities whose administrators and faculty find their work and aspirations resonate with those of the SCL Hub. New members will bring added perspectives from their diverse geographies and sociocultural systems, enabling us to build a more robust global network. The imperative to integrate the needs, knowledge, and priorities of urban systems with those of rural productive systems and biodiverse wildlands has never been more apparent. The SCL Handbook represents a developmental milestone toward this end. We invite the reader to explore the totality of the handbook to see how the SCL approach could play out in cities and landscapes across the Pacific Rim and around the globe.