

Chapter 4

The Environmental Value of Sustainable Urbanization: *Building Resilient Urban Development*



Current international debates are characterized by urban optimism, as sustainable urbanization is recognized as a transformative force to harness environmental value. The implementation of the 2030 Agenda for Sustainable Development, the New Urban Agenda, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction are embedded in this urban optimism. There is also the implicit agreement that actions at the local level will bridge the gap between intended contributions from countries and the actual emission reductions required to keep global average temperature change within safe levels. The adoption of these global development agendas as well as the ushering in of the Decade of Action to deliver the SDGs presents an opportunity for pragmatism whereby urban actors have to demonstrate the effectiveness of existing actions.

Unplanned and unmanaged urbanization represents a threat to environmental sustainability, including unbridled urban sprawl, irreversible land-use changes and biodiversity loss, resource and energy-intensive consumption patterns, and high levels of pollution and carbon emissions. However, when well-planned and managed, urbanization provides opportunities to address these challenges and contribute to environmental value through energy innovation, sustainable settlement patterns, changes in human behaviour and lifestyles, environment-related improvements to health and wellbeing, and resource efficiencies.

Quick facts

1. Nature-based solutions represent an integrated approach to deliver environmental value across the urban-rural continuum.
2. While environmental and conservation projects are adding value to the urban environment, some are having unintended impacts particularly on marginalized groups who are being pushed out by the changing conditions for habitation such as the appreciation of property values and rental costs.
3. Sustainability policies to unlock the environmental value of urbanization depends on the ability of different actors to tailor options to the context in which they operate as well as incorporate the principles of justice.
4. Despite its ravaging impacts, COVID-19 has shown that a green urban future is possible due to behavioural change; COVID-19-induced lockdowns have resulted in a fall in carbon emissions and short-term improvement in air quality in cities.
5. While there have been improvements in global coverage of basic services over the past two decades, which have environmental benefits, particularly for slum dwellers, more needs to be done for this population most at risk of being left behind.

Policy points

1. Harnessing the environmental value of urbanization requires a more participatory approach to planning. An intersectional approach is thus key to understanding the needs and concerns of different groups.
2. Urban greening initiatives enhance the environmental value of urbanization, but adequate measures are needed to ensure that they do not exacerbate inequality and social vulnerability.
3. A green economic recovery from the COVID-19 pandemic involving investment in clean technologies such as renewable energy can yield long-term environmental benefits while reducing emissions.
4. The environmental value of sustainable urbanization cannot be realized without prioritizing the needs of disadvantaged groups.
5. Implementing the 2030 Agenda and the New Urban Agenda is key to enhancing the environmental value of urbanization.

Urbanization transforms society's relationship with its environment. Urbanization presents environmental challenges, including land-use changes and biodiversity loss,¹ resource and energy-intensive consumption patterns,² and high levels of pollution and carbon emissions.³ At the same time, urbanization in the 21st century opens up opportunities to address these challenges and contribute to environmental value through energy innovation, sustainable settlement patterns, changes in human behaviour and lifestyles, environment-related improvements to health and wellbeing, and resource efficiencies. Debates on the environmental impacts of urbanization are often polarized between those who see cities as an opportunity to reduce global environmental footprints and those who view urban growth as leading to irreconcilable environmental trade-offs.⁴ While this Report acknowledges the environmental harm of unplanned, poorly managed urbanization, this chapter focuses on how to harness the transformative power of sustainable urbanization to enhance environmental value and advance the New Urban Agenda and the Sustainable Development Goals.

Scientific models have linked urbanization with environmental impacts on a global scale.⁵ Developing the world's infrastructure to the level of industrialized countries (those included in Annex 1 to the Kyoto Protocol) has been estimated at 350 Gt of CO₂ equivalents only from materials production (or between 35–60 per cent of the carbon budget available before 2050, if the increase in global average temperatures remains under 2°C).⁶ Unsustainable urbanization's impacts on land transformations and accelerated biodiversity loss are also documented.⁷ Moreover, evidence suggests that the environmental impacts of urbanization are increasing, not only on climate but also on air pollution, ecosystems, land use, biogeochemical cycles, water pollution and solid waste management, with devastating impacts.⁸ In the US, the expansion of the wildland-urban interface (WUI) contributes to ravaging wildfires as sprawling cities encroach on forests.⁹ In Europe, one in every eight (or 13 per cent) of deaths is attributed to poor quality environments; the urban environment is characterized by the presence of multiple stressors, with

Box 4.1: COVID-19 pandemic and the glut in plastic waste

The COVID-19 pandemic has furthered the collapse of oil prices, a major constituent of most plastics, making them cheaper to produce. The pandemic increased the consumption of single-use plastic, for example by an estimated 250–300 per cent in the US. Cities such as Athens, Greece, have recorded a 150 per cent increase in the amount of plastic found in the general waste stream. In low-income countries, the situation might be precarious as 93 per cent of waste goes into open dumps.

Source: *The Economist*, 2020b.

people in cities being more exposed to air pollution, noise and chemicals while also having less access to green space than people in rural environments.¹⁰ Further, the disruption caused by the COVID-19 pandemic may exacerbate some of these environmental challenges (Box 4.1). Urban lifestyles are also blamed for eroding traditional and indigenous knowledge that prizes more harmonious engagements with land, biodiversity and ecosystems.¹¹

There is, however, an alternative outlook that views urbanization as a powerful force to foster an alternative engagement with the planet that moves humanity towards more sustainable socio-ecological relations. In this view, urbanization can mediate the radical change required for a sustainable society.¹² Indeed, well-planned and managed urbanization contributes to environmental sustainability by mitigating and adapting to climate change while building long-term resilience that enhances the wellbeing of urban and rural dwellers alike in a prosperous economy. Chapter 1 outlines how well-planned and managed urbanization adds environmental value, including by promoting clean energy; sustainable land-use patterns in urban development; ecosystems and biodiversity protection; healthy lifestyles in harmony with nature; sustainable consumption and production patterns; building urban resilience; disaster risk reduction; and climate change mitigation and adaptation. However, urbanization patterns are also highly uneven.¹³ Harnessing the environmental value of urbanization depends on the ability of multiple actors to deliver an array of actions at the urban scale that respond to context-specific challenges, whose impact can expand across scales.

The notion of value introduced in Chapter 2 emphasizes that the relative worth of something depends on multiple

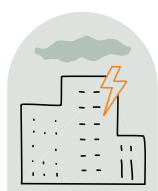
dimensions. The question “value for whom?” formulated in Chapter 2 emphasizes that social positions, needs and interests determine values. Environmental value depends on existing social and ecological relations, and it is closely linked to questions of decision-making, social inclusion and human rights.¹⁴ Environmental valuation has profound ethical dimensions.¹⁵ Determining how to calculate environmental value requires understanding the multiple interconnected challenges that affect cities and human settlements, as well as how different social groups access natural resources and experience environmental impacts. Active efforts to plan urbanization can integrate diverse perspectives and produce shared proposals for action towards sustainability. Such efforts must balance the perceived effectiveness of specific actions with the context-specific challenges that different social groups face in cities and human settlements. This definition of environmental value is consistent with the findings of the 2016 World Cities Report, which emphasized how principles of environmental justice, including the recognition of multiple scales of valuation and the participation of diverse publics in decision-making, constitute a useful and practical paradigm for urban management.

Well-planned and managed urbanization can enhance environmental value in many ways. Still, the effectiveness of different initiatives will depend on the capacity of different actors to maintain long-term processes of sustainability governance and planning that integrate social and environmental needs. Resilient urban development depends on establishing the enabling conditions to deliver on long-term sustainability visions. International initiatives such as the New Urban Agenda highlight the importance of action across multiple levels of governance, including cities and human settlements, and



Separation of household waste in a recycling factory, Lampang Province, Thailand. © Gigira/Shutterstock

the role they play in delivering the SDGs.¹⁶ For example, the transformative power of urbanization is central to deliver climate change adaptation and mitigation.¹⁷ Pioneering reports such as UN-Habitat's *Cities and Climate Change: Global Report on Human Settlements 2011* revealed the full range of policy initiatives available to address climate change in cities and human settlements.¹⁸ Since then, new approaches to governing climate change in cities and human settlements have led to numerous technical, social and policy innovations.¹⁹ The adoption of the Paris Agreement on climate change in 2015 has led to a pragmatic turn in climate governance, with a focus on the evaluation of action on the ground.²⁰ The New Urban Agenda and the 2030 Agenda for Sustainable Development provide an enabling framework to harness the potential of transformative urbanization. However, there still lacks large-scale assessments of sustainability action and their linkages to urbanization. The perception that local action is too fragmented to have a global impact is still pervasive in international policy circles, although that attitude is changing as subnational authorities engage assertively in climate diplomacy (Chapter 7).



Resilient urban development depends on establishing the enabling conditions to deliver on long-term sustainability visions

Finally, not all environmental initiatives are benign. Some are merely superficial, or “greenwashing.” Others lead to “green gentrification,” exacerbating inequality and social vulnerability in cities. For example, recent assessments of urban greening initiatives such as the High Line and Brooklyn Bridge Park in New York City indicate that, while they have resulted in positive environmental outcomes (increase in green space, reduction of pollution), they have been associated with the displacement of low-income residents.²¹ Similarly, green urban enclaves promoting social and spatial exclusion have emerged whereby high-income population groups are able to securitize land and resources to the exclusion of other groups.²² The New Urban Agenda and SDG 11 place emphasis on inclusive settlements and provide frameworks for unlocking the environmental value of urbanization for all, rather than for a rarefied elite.

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This chapter first focuses on the international imperative to harness the environmental value of urbanization as enshrined in global policy agendas. It then discusses challenges to realizing the environmental value of urbanization. The chapter then maps the action space to deliver environmental value and discusses the principles of environmental justice that must underpin efforts to unlock the environmental value of cities and avoid the contradictions of green urban development.

4.1. Environmental Values through the Lens of the Global Development Agendas

The United Nations system-wide strategy on sustainable urban development recognizes the intersection of SDG 11 with the other SDGs, noting, for example, that stronger climate action is one of the overarching outcomes that should emerge from sustainable urban development patterns.²³ The IPCC has stated that it is difficult to imagine how a 1.5°C world would be attained unless the SDG on cities and sustainable urbanization is achieved in developing countries.²⁴

Consequently, cities play a large role in the fight to limit the worst impacts of global warming. As UCLG has argued, the 2030 Agenda represents a “new social contract” to co-create a sustainable future for the planet.²⁵ Local governments are key players in this act of co-creation and the SDG 11 targets provide a starting point for local governments and partner institutions like regional and national governments, community groups and the private sector to launch the kind of initiatives that can deliver on those targets. Achieving those targets depends on harnessing the environmental value of urbanization processes. Table 4.1 illustrates some context-specific examples whereby a range of organizations can intervene to deliver environmental value.

Table 4.1: Examples of environmental values associated with the targets of SDG11, alongside existing projects that enhance those values

SDG11 Target	SDG 11 Indicator	Relevance to deliver environmental value	Context-specific examples of actions
11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing	Access to adequate and affordable housing and basic services improves communities' health and wellbeing; it also prevents informal urban development in sensitive ecosystems, as well as water, soil and air contamination from untreated sewage and improper solid waste collection.	The Centre for Community Initiatives (CCI) in Dar es Salaam, Tanzania, supports community management projects to provide access to water and sanitation. ²⁶ CCI is increasingly committed to intersectional and gender-based perspectives on development that reveal the differential impacts of structural vulnerabilities.
11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	11.2.1 Proportion of population that has convenient access to public transport, by sex, age, and persons with disabilities	Public transit supports mobility needs while reducing the overall environmental impact (reducing pollution of emissions, GHG emissions and land consumption).	Bus rapid transit systems have proliferated throughout the world as efficient, grade-separated mass transit at a lower price point than rail projects. Hanoi, Viet Nam launched its first 14.7 km busway in 2017, serving 14,000 riders daily. The Hanoi Urban Transport Development Project estimates that 23 per cent of those riders switched to BRT from driving private vehicles, which will reduce the city's carbon emissions by 122,177 tons through 2025. ²⁷
11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 Ratio of land consumption rate to population growth rate 11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically	Land transformations represent one of the main impacts of urbanization. Increasing environmental value thus requires incorporation of multiple perspectives in the planning processes regarding relative impacts and benefits.	The Dutch NGO Both ENDS has implemented a rights-based approach to land governance called Participatory Land Use Planning to recognize and secure land rights. ²⁸ A pilot project to improve spatial planning in the Sanggau district of West-Kalimantan, Borneo, Indonesia, showed that communities' negotiations with companies happen on unequal terms because land rights are not always officially recognized. Mapping their land, communities have an additional tool to claim those rights. Similar examples could help to resolve land conflicts in rapidly growing urban areas, particularly to confront evictions. ²⁹
11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage	Preservation of cultural and natural heritage will ensure access for future generations.	The Baiheliang Museum is an archaeological site in Fuling, China submerged under the waters of the newly built Three Gorges Dam. It displays some of the world's oldest hydrological inscriptions, recording 1,200 years of changes in the water level of the Yangtze River. ³⁰ The project has received support from UNESCO, as a flagship project of their submerged heritage programme.
11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations	11.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people 11.5.2 Direct disaster economic loss in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services	Responses to disasters may be determinant on the extent to which the city can recover from a disaster. Effective strategies for managing disaster risk lessen vulnerability in cities and support the constitution of more resilient settlements with substantial additional benefits for people's health and wellbeing.	The Peruvian Ministry of Environment developed an Action Plan on Gender and Climate Change in 2015 that employed a participatory approach to recognize gender-led vulnerabilities and possible actions. On risk management, the plan highlights the role of the Driving Group of Management of Risks, Disasters and Climate Change (GRIDES), a network of institutions aiming at recovering traditional knowledge and integrating it with expertise, which has made a deliberate effort to integrate a gender perspective in their work. ³¹

SDG11 Target	SDG 11 Indicator	Relevance to deliver environmental value	Context-specific examples of actions
11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.6.1 Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal solid waste generated by cities 11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	Reduction of pollution in urban areas (solid waste, emissions) improves the immediate living environment for urban residents.	The Seva Sahakari Sanstha (SWaCH), in Pune, India, is a waste pickers' cooperative owned and operated by over 3,000 members, most of whom are women and Dalits. They provide door-to-door waste collection services to more than 2.3 million residents, including more than 450,000 slum dwellers. ³²
11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities 11.7.2 Proportion of persons victim of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months	Green and public spaces that are accessible to all constitute a shared collective resource that not only enhances community cohesion but has direct benefits for health, wellbeing, and the ecological systems.	UN-Habitat is currently implementing the Global Public Space Programme to support cities in improving the quality of public spaces (Box 4.2). In Kenya, for instance, the programme is supporting the city of Nairobi to revitalize public spaces. Already, an inventory and assessment of public open spaces has been carried out. This inventory is part of a wider collaboration to build the capacity of city staff, civil society and other stakeholders to enhance the quality of public spaces for all.
11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	11.a.1 Number of countries that have national urban policies or regional development plans that (a) respond to population dynamics; (b) ensure balanced territorial development; and (c) increase local fiscal	Urban and regional development plans contribute to equitable development outcomes between urban and rural areas by limiting sprawling urban growth in order to preserve working agricultural land and natural areas that provide ecosystem services.	Rapid urban growth in Ulaanbaatar, Mongolia, threatens the city's sustainability, which depends on managing the subserviced Ger areas that surround the city. In 2014, the Urban Planning, Architecture and Design Institute of Ulaanbaatar City proposed a master plan that recognized the city's nomadic heritage while seeking to resolve the complex relationship with its hinterland. ³³
11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels	11.b.1 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030a 11.b.2 Number of countries with national and local disaster risk reduction strategies	Inclusive strategies for disaster risk reduction increase the resilience of the city as a whole. A holistic approach to disaster risk reduction will include measures to reduce exposure and vulnerabilities, in line with the requirements of the Sendai Framework.	Boston, US, has made racial equity the foundation of its resilience strategy. One focus has been the racially and ethnically diverse Dudley Square neighbourhood. The city has partnered with a local community land trust, Dudley Neighbours Incorporated (DNI), to acquire land to provide essential services within the neighbourhood, including community gardens and an urban farm, which improve food security and strengthen the infrastructure for close collaboration with the community in the event of future shock or stress events. ³⁴ Birmingham, UK, held the first UK Citizens' Assembly on climate change. The assembly was commissioned by six cross-party House of Commons Select Committees. It is looking at how the UK will reach its net zero emissions climate target and what can be done by members of the public to help reduce carbon emissions. ³⁵

SDG11 Target	SDG 11 Indicator	Relevance to deliver environmental value	Context-specific examples of actions
11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials	11.c.1 Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient and resource-efficient buildings utilizing local materials	The performance of the built environment influences patterns of consumption and reduces carbon emissions from buildings. Built environment initiatives can have numerous social and environmental co-benefits.	“Reinventing Cities” is a competition organized by C40, with the support of the European Institute of Innovation and Technology Climate Knowledge and Innovation Community (KIC). The objective is to deliver urban projects to drive carbon-neutral and resilient urban regeneration in sites in decline. All the projects combine a design-led approach to retrofitting with profound social concerns. The first 20 winners of the competition include a social housing project in Milan (Italy), a market in Madrid (Spain) and an urban community to support housing with a focus on people with disabilities in San Francisco (US). ³⁶

Box 4.2: Creating environmental value through public space

Launched in 2012, and currently active in over 75 cities, UN-Habitat’s Global Public Space Programme promotes safe, inclusive and accessible public space as a cornerstone of sustainable cities and communities. The programme’s focus areas include:

- **Public space assessment:** A comprehensive citywide inventory and assessment of public spaces enables city leaders to know the state of public spaces within their jurisdictions, understand the gaps, set goals, develop strategies and allocate financial resources to meet the demand for public spaces.
- **Capacity development:** Enhancing knowledge and developing capacity of local governments and stakeholders on public space issues at the neighbourhood, city and national levels through a multi-faceted approach.
- **Public space upgrading:** Through an annual call for proposals supported by the Block by Block Foundation, UN-Habitat supports a number of public spaces upgrading projects in developing regions. This upgrading process is participatory, engaging the community and the users.
- **Technology:** The programme leverages digital technologies ICT to engage a wider audience—e.g. children and youth—in urban planning and design processes. Technologies such as Kobo Toolbox and the Minecraft video game are harnessed as tools for crowdsourcing ideas; and
- **Policies:** UN-Habitat supports national governments to mainstream public space in national urban policies as well as local governments in developing local public space frameworks and strategies.

In Nairobi, Kenya, for example, the programme is implementing pilot projects that demonstrate participatory and integrated public space development approaches.

Figure A: citywide inventory and assessment across various regions

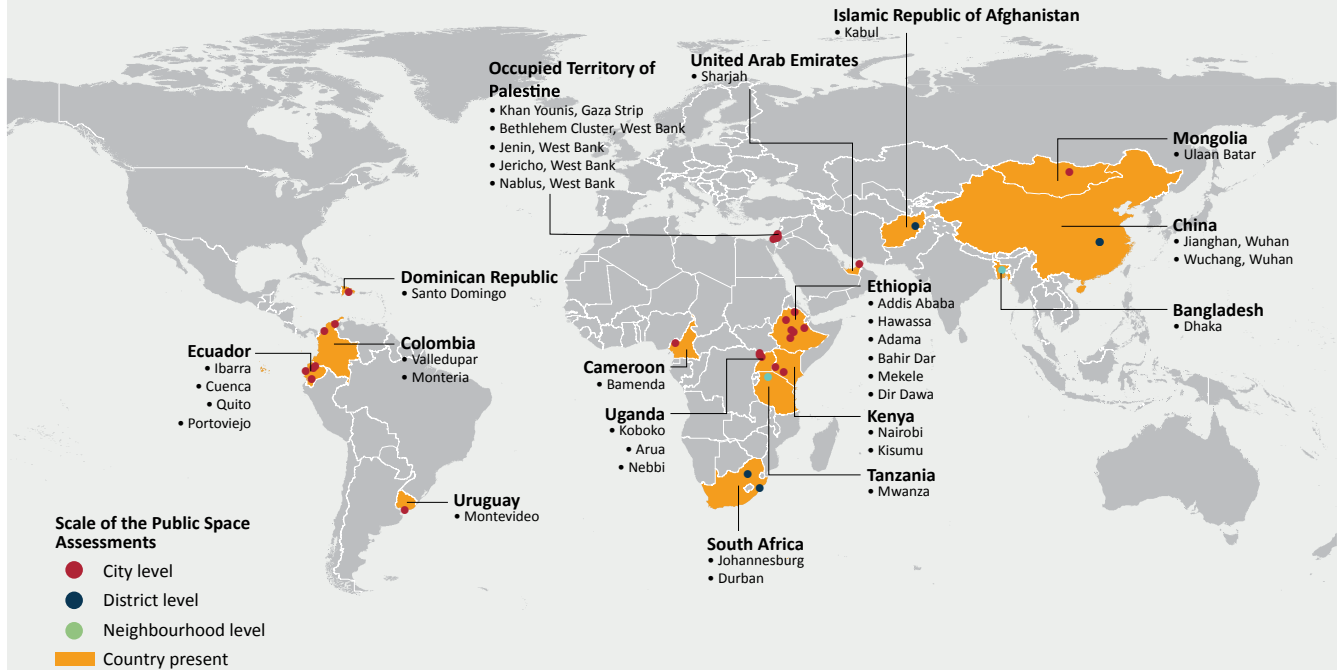
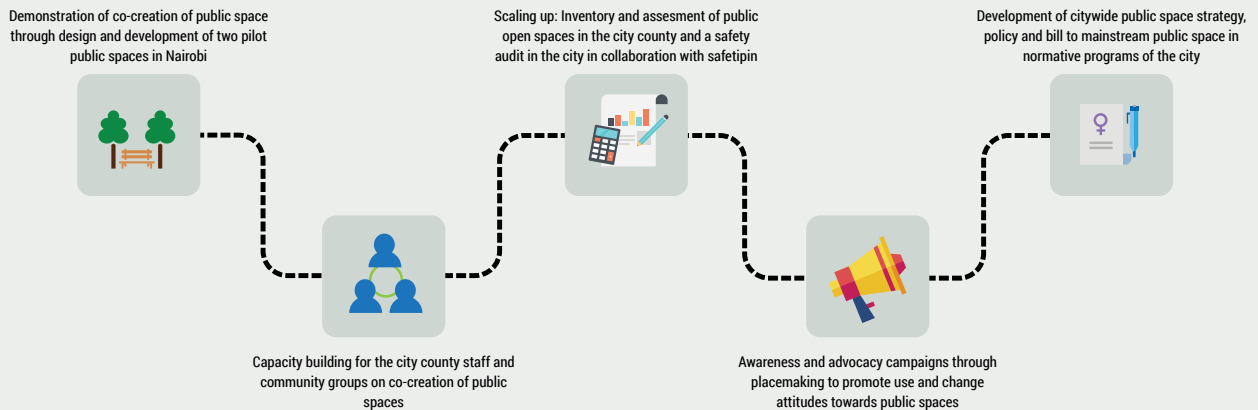


Figure B: Components of the Nairobi public space project implementation



Source: Global Public Space Programme, UN-Habitat.



Pedestrianization of streets in Nairobi, Luthuli Avenue, Kenya. © Mark Ojal/UN-Habitat

The New Urban Agenda has emerged as a distinct tool to achieve the SDGs from the perspective of the development of urban policy that defines environmental protection as a cornerstone of urban development. The NUA is distinct because it establishes procedures to localize the 2030 Sustainable Development Agenda. The NUA also focuses on the interdependencies between social, environmental and economic sectors to deliver SDG 11 alongside the other Global Goals. The commitments made in the NUA's implementation plan demonstrate the need for spatial diagnoses of socio-ecological challenges and the potential of place-based action to deliver environmental value.³⁷

The NUA supports localized action to augment environmental value in cities and human settlements like preserving the human commons, enabling sustainable access to resources and preventing environmental pollution. Simultaneously, the NUA makes explicit the global imperatives that underpin urban policy. For example, the Paris Agreement emphasized the need to build capacity for actions at various levels—national, subnational and local. The NUA supports mechanisms for the coordination of multiple actors' activities to deliver resilience and sustainability in cities for all, and hence, it reinforces the Paris Agreement's commitments.

The NUA's aspirations are also supported by recent global scientific reports that have emphasized the transformative value of urbanization. The IPCC Special Report *Global Warming of 1.5°C* specifies that the mix of adaptation and mitigation options required to deliver an accelerated transition and keep the world safe will have to be implemented in a participatory and integrated manner.³⁸ The IPBES report describes the current trends as resulting from an anthropocentric, materialist worldview that emphasizes utilitarian extraction.³⁹ The IPBES report regards migration and urbanization as disruptors that can catalyse a radical shift in values towards nature and the environment that would sustainably transform the relationship between society and ecosystems. Rather than proposing punctual, sectoral interventions, these reports call for fundamental cultural and social changes to human lifestyles. Oftentimes, the language of global reports does

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Children playing on a playground in Ras Mekonnen, Addis Ababa. © Katla Studios

not always convey the profound political consequences of such transformations, which instead manifest in the worldwide urban climate movements like the Fridays for Future school strikes and Extinction Rebellion, which since 2018 have pressured policymakers on climate change through direct action.

4.2. Challenges to Delivering Environmental Value of Sustainable Urbanization

Environmental value has long been the central concern of sustainability planning as it engages with the classical question of “How can we plan and develop communities that will meet long-term human and environmental needs?” Adding environmental value calls for addressing environmental challenges both at the global and local level while at the same time addressing immediate household needs.⁴⁰ The 2016 World Cities Report identified four environmental challenges cities face that require suitable responses:

- equal access to resources and public services;
- managing environmental risks, from pollution to climate change impacts;
- minimizing the negative impacts of land transformations in the use of resources, biodiversity and ecosystems; and
- responding to the global call for decarbonization and rational use of resources.⁴¹

Rather than serving as a list of areas for intervention, these four elements have to be seen as a series of interrelated challenges that should be addressed simultaneously. This is because of the multiple trade-offs between these different aspects, as illustrated below:

- providing public services in an equitable manner depends on the preservation of ecosystems and the rational use of resources;

- resilience to environmental risks and climate change impacts depends on addressing the structural drivers of vulnerability by ensuring equitable access to urban services;
- land transformations go hand in hand with the deterioration of essential services to more disadvantaged urban populations;
- our capacity to reduce carbon emissions and reduce our global footprint depends on ensuring the conservation of ecosystems and providing efficient urban services.

The transformative commitments of the NUA requires cognizance of these trade-offs. The NUA also recognizes that the impacts of urbanization are noticeable at multiple scales. While urban areas cover less than three per cent of the global land area, there is an accelerated rate of land consumption—exceeding population growth rate (Chapter 3). This trend has a direct impact on biodiversity and carbon pools.⁴² The 2019 IPCC Special Report on Land and Climate Change describes the close links between land transformations and global and regional climate.⁴³ For

example, the report suggests that urbanization increases temperatures in cities and their surroundings (heat island effect) and can intensify extreme rainfall episodes.

Moreover, urbanization in contexts where there are shortcomings in urban planning and risk management, as well as fragmented and overlapping structures of environmental governance, resilience measures are often affected. This is evident from the growth of urban land in flood plains in China, which account for 44 per cent of the total urban land in China.⁴⁴ In urban Africa, the halo around cities shows how land transformation is impacting biodiversity and ecosystems in the urban hinterlands. However, there is also an expectation that urbanization will ease the pressure on ecosystems elsewhere.⁴⁵

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Fire in the outskirts of Lviv Oblast the city, Ukraine. © Maryana UA/Shutterstock

Different social groups have varying experiences in cities. How environmental challenges are experienced and addressed largely depends on a specific group's living conditions

Different social groups have varying experiences in cities. How environmental challenges are experienced and addressed largely depends on a specific group's living conditions. Over 1 billion people live in slums and informal settlements, mostly in South Asia, East Asia, South-East Asia and Sub-Saharan Africa (Chapter 1). UN-Habitat defines "slum-like conditions" based on access to water and sanitation, conditions of housing and security of tenure.⁴⁶ However, these are not the only deprivations experienced in slums. Rather, they are indicators of wider gaps in governance, institutions and the physical provision of built environment and infrastructure. While there is a need to recognize the enormous creativity of people living in slums to get by through these severe environmental conditions in cities, it is also vital to acknowledge slums manifest a dysfunctional relationship between structures of habitation, citizens' needs, the urban economy and governance structures. Informal settlements are also a response to the dwelling conditions created by global capitalism's intense competition for land and profits. Rather than looking at slums as places of squalor to be eradicated, various levels of government need to address the structural conditions that lead to substandard forms of habitation while recognizing existing habitation practices.

While there have been improvements in global coverage of safely managed drinking water (from 61 per cent in 2000 to 71 per cent in 2017) and sanitation (from 28 per cent in 2000 to 45 per cent in 2017), which have environmental benefits, particularly for slum dwellers, more action is still needed for this population most at risk of being left behind. When informal settlement dwellers lack services, they generate alternative "institutions" which provide those services, often with unregulated pricing systems. In India, for example, poor households in informal settlements often resort to private vendors who charge a much higher price than the water supplied by the local government (Box 4.3).

Box 4.3: The water-energy nexus dilemma in Bangalore, India

Bangalore has an important role in the history of infrastructure innovation, for example, after the construction of the Chamarajendra waterworks of 1894 and the installation of the hydroelectric plant of Shivanasamudra in 1906, which made Bangalore the first city to have electricity in India. Urban infrastructure has played a key role in the constitution of Bangalore as a global city, but the infrastructure challenges in Bangalore are also great. Water provision and energy are two key challenges in the city. As time has evolved, the nexus between water and energy has also changed, from an initial state in which water was seen as a productive force, through the production of electricity in hydropower stations, to the gradual way in which power came to be seen as the way to deliver water into the city, through large distance water transfers.

The overlapping systems of water governance as well as the current system of water provision produces injustice in water access because piped networks only cover specific areas, leaving the poorer sectors of the population dependent on private vendors or even water mafias to access water. Communities in peripheral or marginal areas also struggle to negotiate their basic rights with the authorities.

In the meantime, Bangalore has seen a resurgence of citizen-led action seeking to harness the traditional network of water tanks for multiple uses, including actions to rejuvenate blue infrastructure, provide spaces for recreation and create an outlet for treated sewage water. Documenting the lakes, investigating alternatives sources of supply and restoring lakes which have been degraded or polluted are some of the actions that seek to improve the city's blue infrastructure on a day-to-day basis, helping deliver alternatives to access water for the most disadvantaged.

Sources: Castán Broto and Sudhira 2019; Ranganathan, Kamath, and Baindur 2009; Ranganathan and Balazs 2015; Unnikrishnan 2018; Unnikrishnan, Sen, and Nagendra 2017.

Vulnerability to climate change impacts and disasters depends, above all, on structural conditions that determine the possibilities of effective emergency response and post-disaster recovery

Vulnerability to climate change impacts and disasters depends, above all, on structural conditions that determine the possibilities of effective emergency response and post-disaster recovery. While some of these vulnerabilities can be addressed via government-led interventions like early warning systems, infrastructure protection schemes and post-disaster reconstruction programmes, daily living conditions are central to understand people's possibilities to cope with disasters.⁴⁷ Slums and informal settlements generally disproportionately suffer the impacts of climate change and natural disasters as compared to other settlements.

Land transformations also impact informal settlement dwellers directly, for example, if they are involved in urban or peri-urban agriculture or located on land parcels that become desirable to real estate development interests. The global proliferation of securitized spaces like gated communities, which consume large amounts of land relative to the number of residents, exclude the poorest sectors of the urban population who are politically disadvantaged from influencing processes of urban development through existing governance structures. In Brazil, for instance, favela communities were displaced ahead of the 2016 Summer Olympics in Rio de Janeiro.⁴⁸ Difficulties in claiming these land rights often translate to a lack of access to resources and environmental goods.

Like all city residents, slum dwellers also play a role in reducing carbon emissions. Recognizing collective responsibility does not mean, however, that everybody is equally responsible, but that decisions about reducing emissions have to be taken collectively. These decisions should consider the impacts public policies to promote low-carbon energy use may have on the most disadvantaged—who tend to have much lower carbon footprints—for example, restricting their energy access (Box 4.4).⁴⁹ To unlock the environmental value of urbanization, the urban poor must be represented and their needs prioritized in any decision-making processes, be it about the urban commons, atmospheric commons, public spaces or resource use.

Box 4.4: Developing research agendas on urban energy access: experiences from Maputo, Mozambique

In Maputo, Mozambique, the distribution of electricity is uneven and varies, but the use of charcoal is ubiquitous. Household members adjust their energy use depending on the resources available to them. They combine multiple fuels to secure supply, varying their own needs to cope with moments of scarcity. Charcoal remains the dominant source of energy for most households. Factors like the possibility to fraction its use, the perceived control of the supply chain and the perceptions of security in the household have made it difficult to swift to alternative fuels such as liquefied petroleum gas (LPG), despite efforts from the local government to facilitate such change.

There is a growing need for research that challenges long-held assumptions about energy access in urban areas, in line with the SDGs' requirements to align results to people's needs, perspectives and aspirations. Energy access relates to both the current resilience of urban populations and the possibility to deliver sustainable societies in the long term.

Three questions should guide a research agenda on urban energy inspired on environmental justice principles:

"What are the users' needs in specific contexts?" requires an understanding of people's aspirations within specific social and spatial constraints.

"Do we have the appropriate information to address energy access questions?" reflects the chronic lack of data about energy use and demand, particularly in rapidly urbanizing areas.

"What is the match between government policies for energy access and the needs of the urban poor?" addresses the fundamental role that planning can play in transforming about sustainable energy access.

Source: Castán Broto et al. 2017; Castán Broto 2017a.

To unlock the environmental value of urbanization, the urban poor must be represented and their needs prioritized in any decision-making processes, be it about the urban commons, atmospheric commons, public spaces or resource use

The representation of different social groups in the decision-making process is key to achieve stronger results and outcomes. Alongside the physical living conditions and structural successes or failures of governance, the capacity to respond to environmental challenges and add environmental value depends on social and cultural processes in urban areas. A holistic perspective is thus necessary as these processes play key roles in defining sustainability and resilience goals, thresholds and outcomes. For example, aspects like social capital and cultural diversity are closely linked to the process of enhancing resilience to climate change.⁵⁰

While urbanization is a global phenomenon, it is also a complex process whose variations and dynamics cannot be adequately described in a set of universal principles.⁵¹ For example, recent attempts at modelling urbanization impacts have shown how environmental footprint varies significantly across income groups (generally growing carbon emissions in lower-income groups but hindering the growth of emissions in higher-income groups).⁵² Dense urban development also enables the reduction of energy use and, hence, decreases carbon emissions, although this relationship varies geographically.⁵³ There is, thus, a need to characterize the multiplicity of processes in relation to their impacts on the urban environment, understanding urbanization as a series of interconnected processes whose consequences depend on multiple drivers.⁵⁴

In environmental planning and management, the urban environment is commonly perceived as a field divided into separate (rather than interconnected) sectors, which leads to a focus on individual interventions that do not address the structural causes of environmental degradation. Transformation depends on the possibility of urban processes to address structural drivers across different sectors. Recent evidence suggests that social movements and activist groups have an essential role

to play in making those drivers visible. In May 2019, the Fridays for Future school strike took place in 1,594 cities, located in 118 countries,⁵⁵ proving that cities are critical sites of mobilization to demand actions for climate change.⁵⁶ Greta Thunberg is the most salient face of a global movement of young people seeking to hold governments to account. She emphasizes that lack of political will and sheer irresponsibility is taking the planet to the point of no return. Urbanization and its environmental impact need to be understood within the political and economic drivers at the root of the global environmental crisis.

More recently, the COVID-19 pandemic brought about unprecedented global disruptions. Drastic measures to combat the novel coronavirus have raised environmental activists' hopes for a similarly bold response to global warming; COVID-19 has shown that a green urban future is possible. During the peak of global lockdowns in March and April 2020 to slow viral spread, COVID-19 led to a sudden fall in carbon emissions and improvements in air quality in cities, providing the world a brief window into the decarbonized, sustainable future environmental advocates have championed for decades (Box 4.5). "Well-designed stimulus measures that support a green economic recovery can yield long-term economic benefits, prevent stranded assets and avoid locking in high-emission and high-polluting infrastructure and transport systems that may last for decades. Aligning urban planning and development with human and planetary health is essential to avoid ecological imbalances, increased risk of exposure to new pathogens and the emergence of new diseases. Only by seizing this moment to expand investments in an equitable green transformation will we create lasting solutions and reduce the risks of future crisis and adequately mitigate the impacts of climate change."⁵⁷

Well-designed stimulus measures that support a green economic recovery can yield long-term economic benefits, prevent stranded assets and avoid locking in high-emission and high-polluting infrastructure and transport systems that may last for decades

Box 4.5: COVID-19 and reduced emissions

The COVID-19-induced lockdown has led to improvements in the urban environment. Global CO₂ emissions in 2020 are expected to fall by eight per cent or almost 2.6 billion tonnes in what is seen as the biggest ever annual drop in carbon emissions. In China, CO₂ emissions fell by 25 per cent or more in January 2020 when compared to the same period in 2019, driven mainly by a 37 per cent decline in coal consumption and crude oil use. In India, CO₂ emissions fell for the first time in 40 years. They reduced by 15 per cent in March and 30 per cent in April 2020 not only as a consequence of the COVID-19 lockdown, but also due to a pre-coronavirus weakened demand for coal. In March 2020, New York City experienced a 5–10 per cent drop in CO₂ emissions and a 50 per cent fall in carbon monoxide emissions attributed mainly to a 35 per cent decline in traffic.

In just two months following COVID-19 related lockdowns, scientists and residents alike observed remarkable reductions in air pollution. Satellite imagery from Hubei province in China showed a significant decline in the levels of PM_{2.5} nitrates following the imposition of travel restrictions to curb the spread of the virus. Similar trends were observed in Republic of Korea, Italy, Spain, UK, India, Saudi Arabia and United Arab Emirates.

Cities in Latin America and the Caribbean witnessed reduction in the levels of nitrogen oxide in the wake of the lockdowns. Between the last ten days and first ten days of March 2020, the percentage change in nitrogen dioxide in the atmosphere declined by 40–70 per cent in Bogotá, Lima, Buenos Aires, Medellín, Quito and Guayaquil, which were under total lockdown; and by 5–35 per cent in Rio de Janeiro, Mexico City, São Paulo, Kingston and Santiago, which were under partial lockdown.

Though remarkable, these environmental improvements are likely to be short-lived and will rebound once the global economy returns to its pre-coronavirus production and consumption levels, unless countries use the crisis to deliver on their commitment to sustainable development by investing in cleaner and more resilient forms of energy. Countries must make sweeping investments in clean technologies. Renewable energy is the most cost-effective way to reduce emissions as countries cannot depend on the fortuitous impacts of pandemics to catalyse environmental improvements. As in the case of previous crises, unless the wave of investment to restart the economy is dedicated to cleaner and more resilient energy infrastructure, the rebound in emissions may be larger than the decline.

Source: Abstracted from Chapter 1.

4.3. Mapping the Action Space for Urban Environmental Value

Urban managers, planners and activists working on the ground have long confronted the fact that there are not simple, one-off solutions to unlock the environmental value of urbanization that can be applied uniformly across cities.⁵⁸ For instance, there are models of urbanism that embed multiple aspects of urban life within utopian, technology-oriented visions promising sustainability and low-carbon outcomes. But these “smart” models prioritize corporate interests over the daily needs of everyday citizens, small and medium enterprises, and local institutions, ultimately

failing to address existing urban challenges.⁵⁹ With its call for integrated, long-term policy approaches to urban development, the NUA moves away from such models of technocratic urbanism. However, there are several effective policies, strategies, practices and actors that have enhanced and strengthened the environmental value of sustainable urbanization in different contexts, for example, working with nature in cities to harness environmental value.

4.3.1 Introducing nature-based solutions

Sustainability and climate change action in urban environments is most effective when tied to a wide range of environmental and social co-benefits.⁶⁰ In

In the current international context, action to address global challenges such as climate change and biodiversity loss will be most effective when linked to ongoing sustainability agendas

In this vein, sectoral approaches are problematic not only because they are inadequate to address the multiple environmental challenges of complex systems like cities, but also because they may be detrimental to deliver transformative action if they limit co-benefits and impact negatively on the life and agency of beneficiary groups. In the current international context, action to address global challenges such as climate change and biodiversity loss will be most effective when linked to ongoing sustainability agendas.⁶¹

Nature-based solutions represent an integrated approach to deliver environmental value across the urban-rural continuum. IUCN defines nature-based solutions as “actions to protect, sustainably manage and restore natural

or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human wellbeing and biodiversity benefits” (Figure 4.1).⁶² Nature-based solutions embed environmental value in water and land management practices from the micro-level, such as improving the porosity and permeability of soils, to the macro-level, such as improving the connectivity and resilience of landscapes (Table 4.2).⁶³ In urban areas, nature-based solutions have been linked with positive effects on both urban nature and human health.⁶⁴ However, when applying nature-based solutions to urban environments, there are still knowledge gaps regarding the effectiveness of solutions to address different environmental challenges, the involvement of various stakeholders and specific implementation challenges related to land competition, overlapping regulations and integration with existing infrastructure.⁶⁵

Nature-based solutions have been linked with positive effects on both urban nature and human health



Tanner Springs Park is a remediated wetland and naturalized public space, Portland, Oregon, USA. © Stephanie Braconnier/Shutterstock

Table 4.2: Different types of nature-based solutions with impact at multiple levels

Type of action	Definition	Physical parameters influenced	Ecosystem services delivered (added environmental value)
1 Organic farming ⁶⁶	Integrated farming practices with explicit sustainability objectives, often under a recognized system of certification	Infiltration Interception Ponding Soil surface protection Ecosystem resilience	Soil protection Biodiversity Carbon sequestration Water quality regulation Biomass growth Nutrient regulation Flood regulation
2 Managed rewilding ⁶⁷	Land management techniques to reinstate natural processes such as the free movement of rivers, habitat succession and trophic chains	Infiltration Interception Soil surface protection Ecosystem resilience Dis-connectivity	Soil protection Biodiversity Carbon sequestration Water quality regulation Flood regulation
3 Agro-forestry ⁶⁸	Land management techniques that intentionally combine forestry and agriculture/pasture	Infiltration Soil water retention Soil surface protection Tree resilience	Soil protection Drought regulation Water quality regulation Carbon sequestration Biodiversity
5 Land restoration ⁶⁹	Conservation action to bring a previously damaged land (polluted or degraded) to a productive state, including healthy soils and landscapes	Infiltration Interception Ecosystem resilience Dis-connectivity Water and sediment retention	Soil protection Biodiversity Carbon sequestration Water quality regulation Biomass growth Nutrient regulation Flood regulation
6 Wetlands restoration ⁷⁰	Conservation action to recover the natural functions of wetlands	Dis-connectivity Water and sediment retention	Biodiversity Water quality regulation Nutrient regulation Flood regulation
7 Sediment trapping ⁷¹	Vegetation-based measures to prevent erosion and runoff at the catchment level	Dis-connectivity Infiltration Ponding Interception Water and sediment retention	Soil protection Carbon sequestration Water quality regulation Biomass growth Nutrient regulation Flood regulation

Source: Adapted from Keesstra et al. 2018.

Nature-based solutions are closely linked to the delivery of green and blue infrastructure, that is, a strategically planned network of nature- and water-based features, integrated with the urban environment, that provide multiple functionalities.⁷² There are impressive examples of green infrastructure integrated with urbanization processes. For example, the Netherlands has been implementing the National Ecological Network (NEN) since the 1990s,

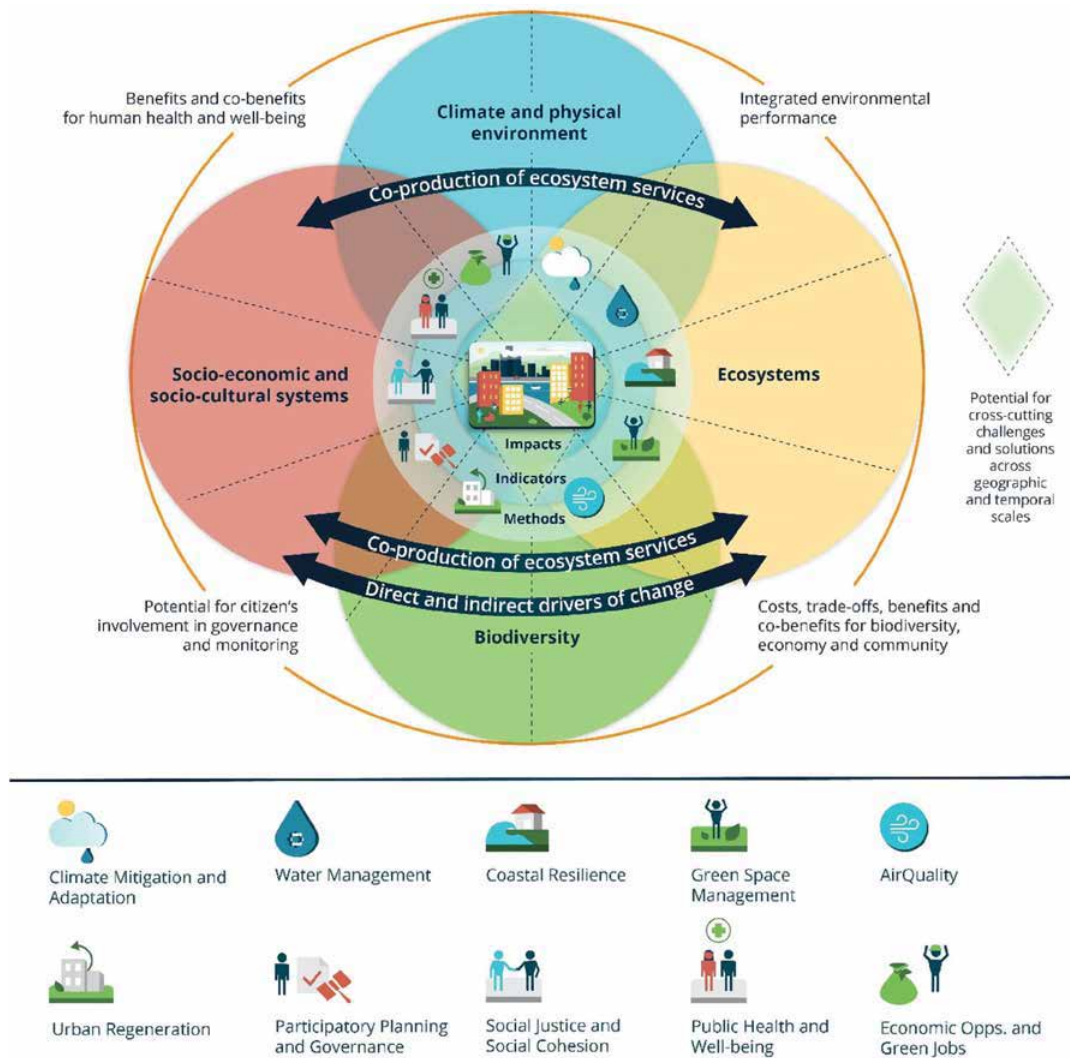
a national project to link nature areas and farmland with surrounding towns. The project has improved, connected and extended nature areas; it can claim credit for 20 national parks, new wildlife habitats, agricultural land managed in nature-friendly ways and over 6 million hectares of conserved water landscapes.⁷³ However, global examples are still few and far between. In many regions, there is a dearth of information on the extent and state of

conservation of green and blue infrastructure. In Africa, for example, there are barriers to the development of green infrastructure, including technical barriers (e.g. lack of data and lack of capacity) as well as more complicated cultural and political barriers (e.g. localized values and perceptions of green infrastructure, access inequalities, spatial trade-offs and conflicts).⁷⁴ Land restoration projects also have the potential to deliver co-benefits for all the SDGs in line with the recommendations of the NUA, but they depend on the

adoption of an integrated landscape approach taking into account the spatial variability of urban areas and the needs of diverse stakeholders.⁷⁵

In many regions, there is a dearth of information on the extent and state of conservation of green and blue infrastructure

Figure 4.1: The Nature-Based Solutions (NBS) assessment framework



The Nature-Based Solutions (NBS) assessment framework considers different elements of the system, the 10 challenge areas that NBS can address in urban environments and a suite of indicators and methods for assessing NBS impacts within and across challenge areas (Raymond et al. 2017, Kabisch et al. 2016).

Box 4.6: From crisis to resilience: urban and peri-urban agriculture in Rosario, Argentina

The city of Rosario is described by environmental activists as an island of agroecological practices in an ocean of soybeans. Since Argentina approved the cultivation of genetically modified soybeans in 1996, the harvested area has grown from 6 million ha to 20 million ha (Fao, 2015). Most of Argentina's soybeans are grown in Santa Fe Province and are processed in the Rosario municipal area for export. Soybean production has displaced other traditional export crops. Horticulture around the city of Rosario is under increasing pressure as farmers lease their land for soybean production.

After the economic crisis of 2000, 60 per cent of Rosario's population had incomes under the poverty line. In 2002, the municipal government, in collaboration with two partners (the national Pro-Huerta programme and the Centre for Agroecological Production Studies, an NGO) sought to find a solution to the alimentary deficiencies suffered by the most disadvantaged sectors of the population. Initial plans for 20 farming groups across the city soon grew into 800 community gardens meeting the needs of 40,000 people. In 2004, UN-Habitat awarded Rosario the International Award for Best Practices in urban development. Today, an estimated 1,800 farmers work in Rosario's community gardens, of which 250 are full-time commercial producers organized in the Rosario Gardeners' Network.

The programme promotes agroecological practices while also building on peer-to-peer training. Moreover, allotments are most often developed in marginal lands otherwise unsuitable for urban infrastructures. Rosario has fully integrated urban and peri-urban agriculture in their urban development plans and coordinated them with other ecosystem management and nature management strategies.

Source: FAO (<http://www.fao.org/ag/agp/greenercities/en/ggclac/rosario.html>).

The alignment of blue and green infrastructure with productive activities that mobilize local socio-ecological knowledge can build long-term resilience. For example, Rosario, Argentina, is now well-known for an urban and peri-urban agriculture programme addressing the needs of the most marginalized while also developing alternative agroecological models for food production that enhance urban ecosystems (Box 4.6). Delivering an urban and peri-urban agroecological programme requires more than just quantitative data like indicators to identify target groups. The most critical forms of knowledge that make the project possible emerge from the actual experience of agriculture: the mastery of agricultural techniques; the identification of farming and allotment locations (understanding of land tenure procedures, and in this case, leveraging social networks and accessing the local land registry); and, importantly, the identification and application of relevant socio-ecological knowledge for the long-term sustainability of the programme, for example, the establishment of a seed bank. While Rosario gardeners are interested in experimenting with different types of crops, their seed bank emphasizes documenting indigenous knowledge about the natural environment

(in this case, Guaraní traditions about plants and their potential benefits). While a localized experience of urban farming may seem limited, the struggle for food in urban areas is intimately linked to the struggle to claim the right to the city and urban food movements provide the opportunity to both empower vulnerable communities and build urban resilience.⁷⁶

4.3.2 Addressing the structural drivers of vulnerability

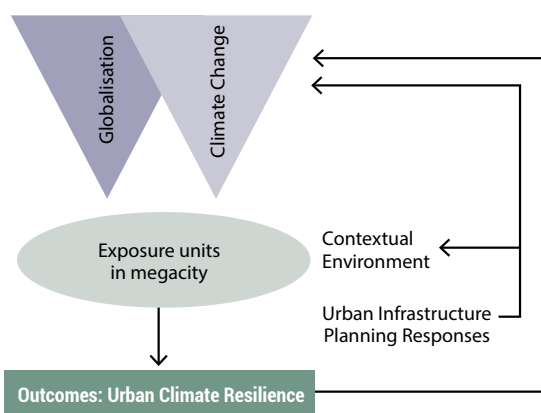
Urban development planning needs to recognize the urgency of the adaptation challenge, particularly for those living in informal settlements. The impacts of climate change and the biodiversity crisis interact with the global processes of economic restructuring and social change that impact directly on the lives of urban dwellers. The “double exposure” framework (Figure 4.2) illustrates the close relationship between global processes of economic change and the eventual outcomes for environmental change.⁷⁷ For example, in large cities such as Manila, Philippines, globalization is changing models of urbanism so that the most common infrastructure planning response is privatization. The immediate consequence of privatization

is increased inequality and uneven climate resilience, creating a polarized metropolis. People living in informal or precarious housing situations are doubly vulnerable. First, these settlement areas are exposed to hazards (e.g. floodplains, steep slopes prone to landslides), and second, when disaster strikes, these areas lack appropriate emergency services. Institutions struggle to assess and tackle the compounded, interconnected character of cascading risks.⁷⁸ Nature-based solutions alone are not sufficient to address structural drivers of vulnerability, which often require deeper processes of socio-ecological change, including measures for social protection, supporting local economies and delivering access to essential services and protective infrastructure.

But the move toward privatization and polarized cities with a gulf between the rich and poor is misguided. Although unplanned development and lack of services in informal settlements can lead to site-specific ecological

Cities can extract useful lessons about sustainable urbanization and environmental value from informal settlements even as they seek to fulfil their obligation to provide basic municipal services

Figure 4.2: The double exposure framework applied to urban infrastructure planning



Source: adapted from Meerow, 2017; Leichenko and O'Brien, 2008.

degradation, their self-built design typically results in pedestrian-friendly, low-carbon urban forms with lower carbon footprints than higher-income formal neighbourhoods. Researchers in Rio de Janeiro have mapped 111 urban sustainability initiatives self-generated in the city's favela communities (Box 4.7). Cities can extract useful lessons about sustainable urbanization and environmental value from informal settlements even as they seek to fulfil their obligation to provide basic municipal services.

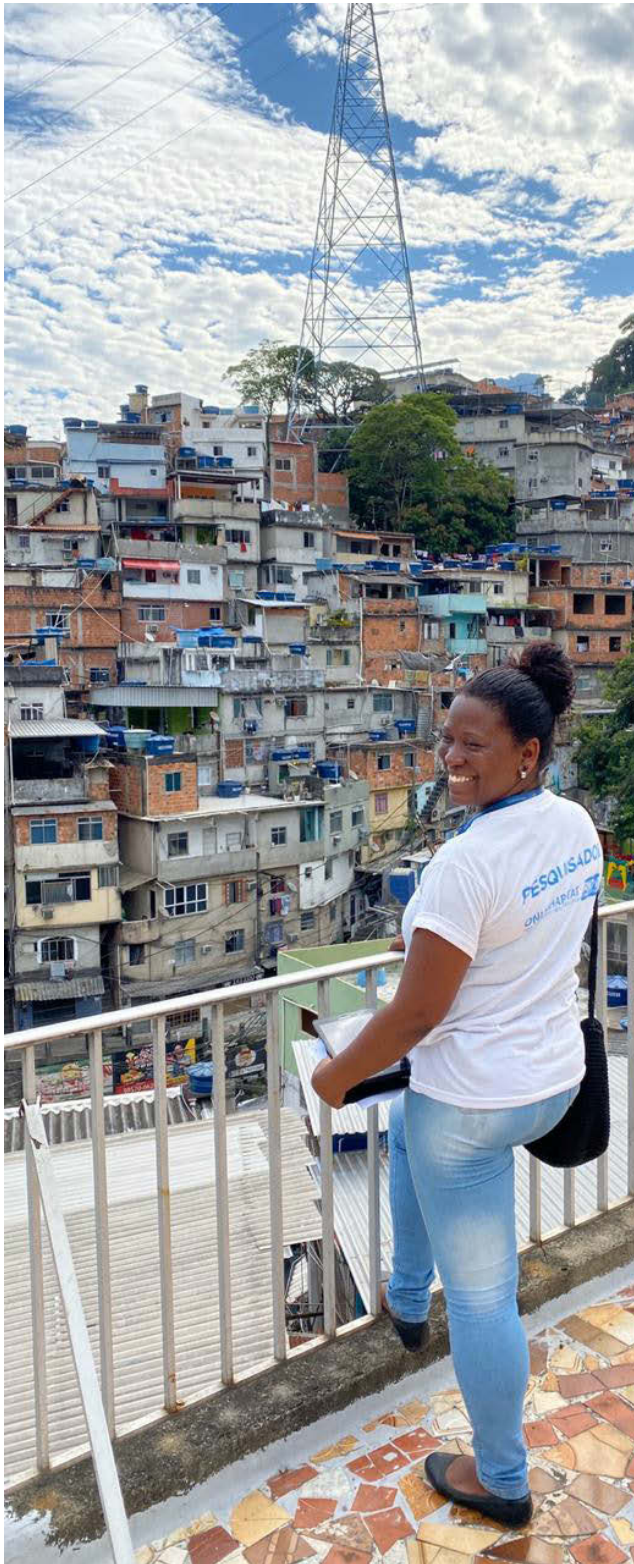
Box 4.7: Sustainable Favela Network in Rio de Janeiro, Brazil

Favelas are home to countless community initiatives through which residents themselves tackle a wide range of challenges. All these initiatives serve to raise awareness among residents who benefit from them, even while they are made necessary due to missing public investment. Furthermore, many initiatives furthering urban sustainability can be found in the city's favelas—qualities which are difficult to develop through centralized planning and which urban planners around the world are trying with great difficulty to stimulate, too little, too late.

For example, Vale Encantado (Enchanted Valley) installed a biodigester with the help of a local university to generate cooking gas for some of the favela's 25 homes and a local eco-tourism cooperative.

Favelas are responding to diverse life challenges through individual action and local collective projects, making them solution factories. Given their history, favelas are areas of the city that require their own development processes based on their assets, and tackling their challenges with these positive qualities as a starting point, without following the all-too-common unsustainable development model characteristic of formal areas of the city. Favelas represent an opportunity for sustainable development outside of traditional formal principles, based on the innumerable assets of the favelas themselves.

Sources: *Catalytic Communities, 2018; Mendes, 2018.*



Rocinha's slum Rio de Janeiro, Brazil. © UN-Habitat/José Bernardo Junior

4.3.3 Conditions for harnessing environmental value through urbanization

The NUA recognizes that there are no universal, ready-made solutions to deliver sustainability. Instead, the delivery of the global development agenda in cities and human settlements requires an integrated approach. Sustainability action to unlock environmental value depends on the ability of different actors to tailor options to the context in which they operate. Moreover, the agenda's acknowledgement of the “right to the city” and “cities for all” explicitly considers environmental justice principles as enablers of inclusive action delivery.⁷⁹ In this regard, harnessing the environmental value in sustainable urbanization rests on two fundamental considerations.

The first consideration is to **situate every urban challenge in the broader context in which it occurs. This requires a view of urban environments that reflects their complexity and enables the identification of trade-offs and interconnections between multiple impacts.** It recognizes cities as complex systems and engages with the socio-ecological relations that take place in the city. These socio-ecological relations need to be understood historically, particularly with regard to the development of urban institutions. For example, the trends of exclusion in Guatemala City's history is today manifested in a pattern of social-spatial segregation—whereby low-income populations have settled in areas highly vulnerable to seismic and geomorphic hazards with limited access to water, whereas higher-income communities occupy safer locations which they transform into securitized enclaves.⁸⁰ Understanding urban history is essential to assess both how environmental change impacts different social groups and the extent to which sustainability action may expose them to unintended impacts.

Understanding context also requires context data. For urban managers, demonstrating that their actions add environmental value depends on data quality and availability. Effective action strategies require data to determine what the environmental value is now and how

Sustainability action to unlock environmental value depends on the ability of different actors to tailor options to the context in which they operate

Understanding urban history is essential to assess both how environmental change impacts different social groups and the extent to which sustainability action may expose them to unintended impacts

it may change. Enormous gaps in urban data exist in cities and urban areas, particularly in rapidly urbanizing regions of Africa and South Asia. Data on informal settlements and rapidly urbanizing urban and peri-urban areas is lacking, especially pertaining to disaster risk reduction.⁸¹ These gaps have led to self-enumeration projects, a practice that informal settlement dwellers have conducted for decades, and, more recently, different forms of mapping urban settlements like the Million Neighborhoods Initiative.⁸² The availability of open data platforms may help create resilience by allow citizens to share real-time data on disasters and crowdsourcing in order to map aftermath impacts.⁸³ However, the development of new data sources has also led to calls for standardization and reliability.⁸⁴

Data needs to be targeted to strategic areas of priority. A study examined 28 international urban databases⁸⁵ for insights into the politics of urban data management.⁸⁶ It found that these databases lack information about critical areas where action is most urgent. In addition, it identified a network of actors who dominate data management and flows, mostly international agencies (the United Nations and the World Bank) as well as philanthropic organizations. Besides this precarious architecture, there is also an imbalance in global coverage evidenced by the lack of adequate representation of disadvantaged regions.⁸⁷

Even when local governments can collect data effectively, they may find themselves without the capacity to analyse it,⁸⁸ and even worse, without the capabilities to share it with citizens and debate its implications. Moreover, holding specific knowledge about their neighbourhood may be the only effective way for deprived and excluded communities to assert any form of control over urban environments and the biophysical processes that affect everyday life.⁸⁹

The NUA supports holistic approaches to urban management that integrate multiple ways of knowing and experiencing

socio-ecological relations. “Knowledge co-production” has become an influential principle in urban planning and management, whether linked to forms of cooperative governance, collaborative planning or participatory decision-making. Knowledge coproduction enables collective decisions about environmental and urban management that recognize multiple forms of expertise, transcend institutional boundaries and avoid legitimating some perspectives over others.⁹⁰ This approach to urban policymaking facilitates the inclusion of multiple perspectives but also questions the structural drivers of inequality and facilitates the adoption of an intersectional approach to the production of knowledge and data.⁹¹ Co-production also enables moving beyond the focus on indicators that still dominate both international development agendas and urban management.⁹²

Knowledge coproduction enables collective decisions about environmental and urban management that recognize multiple forms of expertise, transcend institutional boundaries and avoid legitimating some perspectives over others

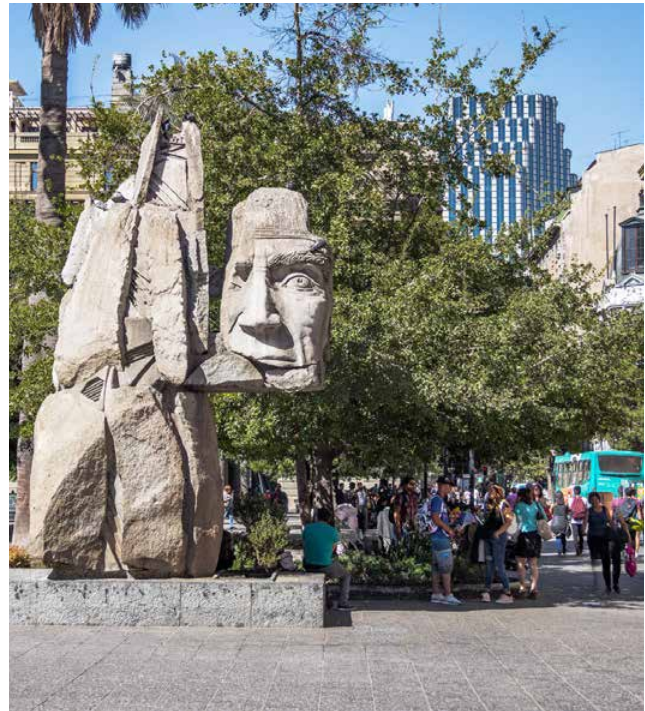
The second consideration is that **any urban management or development proposition must explicitly incorporate justice principles**. This imperative requires taking into account the political and social implications of actions that are intended to unlock the environmental value of urbanization when determining policy actions. With this principle in mind, social equity becomes a condition for making a just transition to sustainability.⁹³ The “just sustainabilities” framework argues that social and environmental justice within and between nations should be an integral part of the policies and agreements that promote sustainable development (Figure 4.3).⁹⁴ According to one recent study of 400 sustainability initiatives in more than 200 urban areas, these principles are already becoming embedded in current environmental action at the local level as cities make efforts to deliver on the NUA and the SDGs.⁹⁵

However, environmental justice discourse must ensure that it does not foreclose the recognition of alternative perspectives from other knowledge traditions, such as indigenous people living in cities. Instead, public participation processes for urban environmental action

Environmental justice discourse must ensure that it does not foreclose the recognition of alternative perspectives from other knowledge traditions, such as indigenous people living in cities

should give a fair hearing to multiple voices, with particular attention to preventing the imposition of more powerful frames of reference, such as those espoused by experts or quantified in indicators over people’s lived experiences, knowledge and values. As such, international law frameworks should protect both the cultural and biological integrity of indigenous peoples.⁹⁶ The cultural and social plight of indigenous people is partially linked to rural-urban migration and the degradation of ecosystems that are sometimes linked to climate change impacts.

As urban indigenous populations grow, cities have responded through both national initiatives and as a result of grassroots pressure. In Canada, the 2015 final report of the Truth and Reconciliation Commission on the legacy of the Indian Residential Schools system called municipalities to action.⁹⁷ In Australia, the Redfern Aboriginal Tent Embassy pressured Sydney authorities to preserve a key parcel for affordable housing.⁹⁸ In the US, non-indigenous citizens of Seattle pay voluntary rent

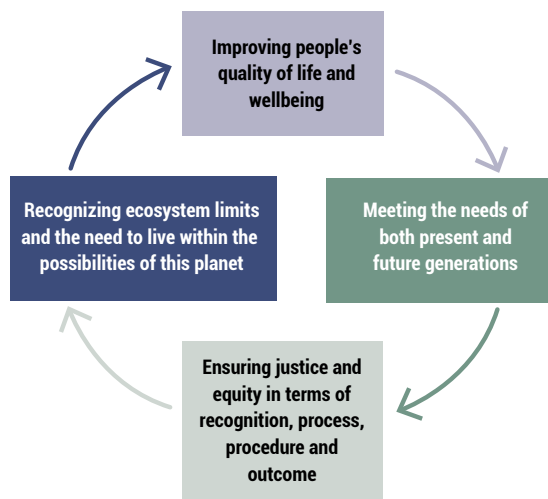


Monument to indigenous people (al Pueblo Indígena) at Plaza de Armas Square, sculpture of Enrique Villalobos, Santiago, Chile. © Diego Grandi/Shutterstock

to the indigenous tribe after whom the city is named and property owners in Portland have begun giving land back to indigenous ownership. In July 2020, the US Supreme Court affirmed indigenous land rights, ruling that much of eastern Oklahoma, including large parts of the city of Tulsa, falls within an Indian reservation.⁹⁹ Overall, cities have responded by adding indigenous languages to place names and signage, consulting First Nations on urban infrastructure projects, conducting land acknowledgments before public events and promoting urban indigenous land ownership and property development. As these official and grassroots efforts show, partnerships for a collective, sustainable future require institutional efforts to recognize the environmental and social value of indigenous knowledge.¹⁰⁰

Building on these two important considerations—recognizing the context and advancing principles of justice—there are six principles that help to promote inclusive action for the creation of environmental value in urban areas and deliver the 2030 Agenda for Sustainable Development in line with the NUA implementation framework (Box 4.8).

Figure 4.3: Principles of just sustainabilities



Source: Agyeman, 2013

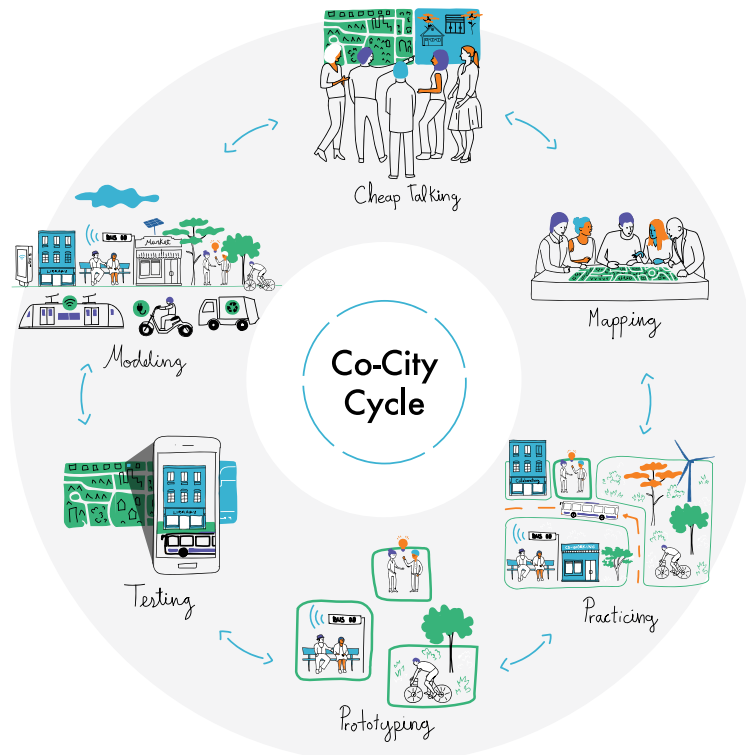
Box 4.8: Six principles for the creation of urban environmental value

1. Recognize and understand the urban commons.
2. Prioritize the needs of the most disadvantaged, creating inclusive forums where they can be represented in ways that move beyond standard clichés.
3. Enrol a variety of actors through multiple institutional and governance arrangements, such as partnerships and networks, experimenting with new forms of cooperative environmental governance.
4. Adopt an intersectional environmental policy that challenges privilege, recognizes and celebrates social and ecological diversity.
6. Investigate points of intervention that enable rapid transformations of existing institutions.
6. Create opportunities for innovation and experimentation.

The **urban commons** are any cultural or biophysical resource accessible to everyone in the city, especially those resources which contribute to developing human settlements.¹⁰¹ Indeed, urbanization has transformative power precisely because of its potential to enable the sharing of social, cultural and natural capital.¹⁰² The urban commons are the basis for collective design processes. For example, in 2014, Bologna, Italy, adopted the Bologna Regulation

on Civil Collaboration for the Urban Commons, whose primary tool was a collaboration pact whereby citizens, the local government and any other interested organizations would agree on care and regeneration actions to improve shared green areas and public spaces (Figure 4.4). Since adopting the regulation, the City of Bologna has signed more than 400 regeneration pacts, all contributing direct environmental value to the city.¹⁰³

Figure 4.4: Design principles of the Co-City Cycle employed in Bologna, Italy



Source: LabGov.City, 2018.

The experiences and needs of the most disadvantaged need to be considered first because otherwise, they may be cast aside by the concerns of the hegemonic groups whose sway in political decision-making leads to environmental inequalities.¹⁰⁴ Moreover, prioritizing the most disadvantaged can generate better urban environmental outcomes; environmental performance is tied to practices within the informal economy in key sectors like public transport,¹⁰⁵ waste management¹⁰⁶ and sanitation.¹⁰⁷ There is increasing evidence that incorporating informal economies—a lifeblood of many cities (Chapter 3)—in sustainability research and policy will have a beneficial effect to add environmental value.¹⁰⁸

Prioritizing the most disadvantaged can generate better urban environmental outcomes; environmental performance is tied to practices within the informal economy in key sectors like public transport, waste management and sanitation

Recognizing social groups within the informal economy is a crucial strategy to deliver environmental value in a manner that puts the needs of the most vulnerable first, for example, through strategies that benefit them directly such as reforming regulatory frameworks, simplifying environmental regulations, encouraging more collaborative governance arrangements and supporting more inclusive urban planning approaches that improve efficiency in environmental management so as to “transition to an economy that is not only greener, but also more inclusive.”¹⁰⁹ These measures are all closely linked to democratization processes and the creation of spaces for participation that tend to be eroded in times of crisis (Box 4.9). They also require an intersectional approach to understanding the needs and concerns of different groups of the population through a diagnosis of the structural causes of discrimination and exclusion, rather than a superficial analysis of identity-based characteristics.¹¹⁰ In other words, authentic inclusiveness must be central to urban and territorial planning processes.

Box 4.9: In times of crisis, grassroots networks are informal workers' bulwark

Women in Informal Employment: Globalizing and Organizing (WIEGO) reports that the rights of informal workers across the world are under threat following a reversal of gains won over the decades. Still, street vendors have found a way forward by activating/mobilizing networks of support (movement building) to navigate these challenging contexts. In Bangkok, Thailand, local authorities worked with street vendors to create a clean, vibrant, shared commercial space. In the aftermath of the 2014 political crisis, massive evictions of street vendors ensued, endangering livelihoods. Consequently, the street vendors organized the citywide Network of Thai Vendors for Sustainable Development. The network created a space to establish their demands for public space management. Through marches, a social media campaign and civil disobedience, the Network has demonstrated the type of participatory practices that add value to Bangkok's public spaces.

Belo Horizonte established spaces for the institutional participation of waste pickers, that benefited the city's waste management systems. An ideological change in politics has led to budget cuts to the institutions responsible for inclusive recycling policy. Waste pickers have mobilized local and national organizations to deliver strategies of resistance. In 2017, they were able to block an incineration bill in a multi-stakeholder public hearing. More recently, they have lobbied state alliances to continue dialogues around the crucial issues that affect them.

In Lima, a pro-poor municipal ordinance supported street vendors directly, after a process of dialogue in a mesa of collaboration between policymakers and street vendors in 2014. However, the implementation of the ordinance has been weak, and instead, street vendors have continued to face evictions from most markets. In response, Lima's street vendors have convened a forum of experts with the hope that municipal officials will consider their innovative proposals.

Source: Harvey and Ogando, 2019; UN-Habitat, 2018b.

A wide variety of actors can be enrolled through multiple institutional and governance arrangements, such as partnerships and networks that experiment with new forms of cooperative environmental governance. The need to engage numerous actors operating at different scales is a recognized requirement of global environmental governance.¹¹¹ What is perhaps less understood is the extent to which partnerships at the local level can implement action to make a global difference.¹¹² While the notion of a global partnership is enshrined in SDG17, greater emphasis must be put on aligning the actions of international actors and coordinating the delivery of national agendas than on delivering the kind of incremental action at the local level that only enable changes to the quality of life of a city's inhabitants.¹¹³ Often, a focus on alignment and leadership by municipal officials and other environmental policy champions may obscure the complexity of interactions that support action to increase the environmental value of urban areas. Scholars studying governance processes often describe successful policy action as emerging from “muddling through” a process that relies on temporal forms of consensus and experimental approaches to feasible actions.¹¹⁴ The question is the extent to which deliberative governance processes enable a deep reflection

The need to engage numerous actors operating at different scales is a recognized requirement of global environmental governance

of the power dynamics that shape the process and whether they are explicitly acknowledged in the interactions between multiple actors.¹¹⁵

There is a need for developing **intersectional environmental policies** that question privilege as the root of current environmental problems and celebrate social diversity. Such a policy lens aligns with the NUA's commitment to deliver gender- and age-responsive planning and investment, though intersectional approaches typically go further to account for race and ethnicity. With its roots in anti-racism and feminist movements, environmental justice, as a social movement, is deeply concerned with the intersecting mechanisms of exclusion and oppression that people experience in their daily lives. An understanding of how social structures shape processes of environmental degradation has helped to consolidate environmental justice as a movement that transforms urban policy while transcending local spaces of action.¹¹⁶

Local environmental action needs to focus on **particular intervention points that can activate rapid institutional transformations**. While the interconnectedness of the urban cultural and biophysical fabric most often calls for holistic visions that integrate a multidimensional view of the urban context, action may also require an analytical perspective that enables identifying where to intervene to have the maximum impact with the resources available. For example, the court system is the new arena where urban

Box 4.10: Why European parents are suing their cities over poor air quality

Seven years ago, Lies Craeynest won a €10,000 neighborhood improvement grant from the local council in her Brussels district. She planned to spruce up the busy arterial street where she lives by working with her neighbors to grow climbing plants along the houses. But the council government had a warning about her choice of plants: If you live on an arterial street, weak varieties will die from toxic air.

For Craeynest, a mother of two, the warning was a gut punch. Craeynest is among the plaintiffs in a lawsuit against the Brussels government for failing to meet European Union air quality standards. The lawsuit is one of 80 cases that environmental law non-profit ClientEarth has waged against European city governments and arguably the most significant, with the European Court of Justice ruling in the citizen activists' favour in June 2019.

Source: Scruggs, 2020.



Woman on e-bike in smog blanketed city. Beijing, China. © TonyV3112/Shutterstock

environmental battles are fought. London held an inquest into the air pollution that caused the asthma-related death of 9-year-old Ella Kissi-Debrah in 2013.¹¹⁷ European NGO ClientEarth has sued 80 municipal governments over air quality in violation of EU standards (Box 4.10). However, the NUA does not explicitly acknowledge the role of the courts in shaping environmental policy.

Finally, the creation of urban environmental value requires **understanding the complex processes and multiple locations of innovation**. As discussed in Chapter 6, innovation in the broad sense lies both in scientific and technological developments but also in the creative actions of governments and citizens that strive to use new institutional arrangements to address urban challenges. These processes are diverse, and there is now a plethora of strategies to foster innovation in urban environments from state-led technological incubators to entrepreneurial start-ups, or collaborative urban labs (Chapter 6).¹¹⁸ Spaces of innovation, however, are constituted through the interactions of entrepreneurial or experimenting actors, processes of urban governance and the dynamics whereby innovations are embedded in the urban fabric and adapted to social practices. The analysis of energy transition in cities such as Rizhao or Shenzhen (China), for instance, suggests that a factor of success was the strong partnerships local governments and industries that fostered innovation.¹¹⁹

4.4. Unintended Impacts of Urban Sustainability Policies

Ongoing planning and policymaking practices are associated with an urban action gap and the challenges of dealing with green gentrification and the securitization of urban natures. Are cities and urban areas expected to fill in the gap between action pledges and the action needed at the global level? While urban areas are leading the localization of the global agendas, they should not be expected to meet the “action gap” because the global commitment to social change is something that pertains to a broader cultural and political change, part of which goes beyond the sphere of action of local governments, civil society and local businesses. The potential for innovation in urban areas is recognized but should not distract analysis from actual imperatives for national or global action. While empirical research documents specific

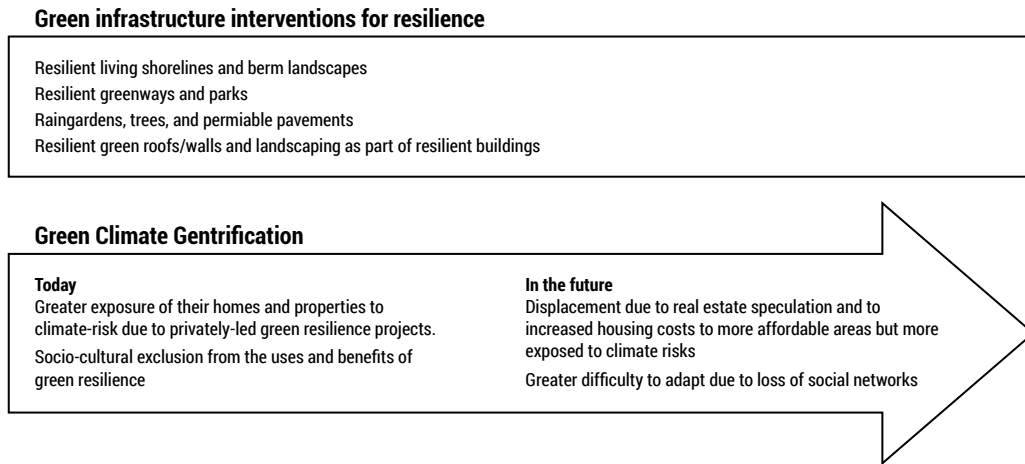
The potential for innovation in urban areas is recognized but should not distract analysis from actual imperatives for national or global action

case studies in detail, it does not provide a generalizable explanation of the visible gap between rhetoric and action in urban environmental policy.¹²⁰ Systematizing the impact of local action through the calculation of aggregated global outcomes may not ever be possible.

For example, the Paris Agreement formalized the principles of voluntary commitments to climate action.¹²¹ Under the agreement, nation-state parties present their commitments in the form of Nationally Determined Contributions (NDCs).¹²² Since the adoption of the Paris Agreement, there have been calls for subnational actors to bridge the gap in emissions.¹²³ Action outside the UNFCCC regime has been led by a host of actors, including civil society, subnational governments and businesses who argue that they could achieve additional reductions of greenhouse gas emissions. Initiatives like the Non-State Actor Zone for Climate Action (NAZCA) record those initiatives at a global level and mark their extent and significance.¹²⁴ These actions are varied. They cannot be reduced to measures of emissions reductions because they have multiple co-benefits. They cannot be aggregated because they involve context-specific action. Moreover, the difficulties of integrating local sustainability objectives in international policy should not distract us from the multiple ways in which local action delivers environmental value.

Global aspirations to bridge the sustainability action gap pose additional demands on local governments and other local institutions, but often, without additional resources or capacities to enable local governments and other urban actors who are already under-resourced and ill-equipped to respond to these challenges. The SDGs provide a target-based framework to evaluate sustainable development: an instrument that guides action towards collective agreements. Also, the NUA goes beyond the aspirations of the 2030 Agenda for Sustainable Development by providing an integrated vision that situates those objectives in context, beyond an approach that reduces human and ecological wellbeing to indicators. As debates

Figure 4.5: How green gentrification affects poor urban communities in the context of building resilience



Source: Anguelovski et al. 2019.

on environmental justice have made clear, target outcomes alone should not guide the intent of sustainability action. How environmental value is delivered matters as much as achieving that result.

For example, recent scholarship has grown increasingly concerned with the production of new forms of inequality associated with green action and sustainability policies. Is green action in urban areas a new driver of inequality? Critical case studies show shortcomings in the association of environmental policy and social injustices. For example, urban areas are finding a new challenge in green and climate gentrification processes whereby people are excluded not only from housing and public space but also from safe and protected environments. Urban ecological security emerged as a new paradigm of urban management in the first decade of this millennium, whereby urban elites focus on ensuring the continuity of the city within available resources.¹²⁵ The concern is that attempts at securing privileged enclaves leads to the fragmentation of urban space, with the effects of that fragmentation felt most acutely by the most disadvantaged.

This practice has evolved into a dynamic of extra-urban and intra-urban forms of differentiation in which access to environmental resources and exposure to environmental risks constitute a new measure of urban inequality. More recently, there has been a wave of studies, mainly focused

on North American cities, that have examined a trend towards “green gentrification” and its link to resilience and climate change adaptation policies.¹²⁶ Green gentrification means that as environmental and conservation projects add value to the urban environment, marginalized groups are pushed out by the changing conditions for habitation, for example, because of an increase in housing prices and rents. The impacts of green gentrification impact over time (Figure 4.5). There is a fear that this dynamic will translate into the constitution of exclusive safe enclaves protected from climate change impacts, which could constitute, in effect, a form of climate apartheid.¹²⁷ While these practices will undoubtedly exacerbate the income differences between different groups, they will have devastating consequences for people who are particularly vulnerable to climate impacts.

4.5. Concluding Remarks and Lessons for Policy

The 2030 Agenda for Sustainable Development and the New Urban Agenda provide the opportunity to deliver a truly innovative programme for urban action that harnesses the transformative power of urbanization for the delivery of environmental value at all scales. Urban environmental planning and management provide multiple opportunities to deliver sustainability

improvements in specific neighbourhoods, build resilience at a citywide scale and address global environmental challenges head-on. The 2030 Agenda provides targets to orient environmental action. The NUA provides guidelines to integrate development objectives into a holistic vision of a liveable, sustainable city.

There is an ample range of initiatives to deliver environmental value in urban environments. However, outcomes are highly dependent on the form of execution. The possibilities of environmental benefits of urbanization depend on how cities are planned and managed. Ensuring due process and recognition of multiple points of view are conditions for delivering sustainable development for all, requirements already enshrined in the NUA. For example, increasing understanding of the potential of nature-based solutions and green and blue infrastructure to deliver environmental benefits alongside more conventional transport and waste management interventions needs to be balanced with the realization of how green gentrification is driving further processes of urban exclusion.

Urban managers need to integrate sustainability policy with planning and social policy. One way to do so is through observing the six principles for adding environmental value through urban planning and management interventions proposed in this report.

The recognition of the **urban commons** as socio-ecological assets, shared across the city, starts in the conceptualization of urban policy and plans. Collectively developed inventories of shared assets help to recognize, and hence, protect those commons. Local governments play a role in mediating the generation of a collective pool of knowledge that can be mobilized for the protection of the commons.

Prioritizing **the needs of the most disadvantaged** means creating opportunities within local planning processes to represent their views, something already reflected in the 2030 Agenda.

Urban managers can develop mechanisms to ensure a **wide diversity of actors** is represented in decision-making processes. Those mechanisms need to move from mere consultations or token participation. Municipalities are

key enablers of action, providing assets and finances for civil society organizations and businesses. They can also enter formal partnerships to deliver on a given objective.

Adding environmental value depends on the ability of urban actors, especially local governments, to recognize the **social and ecological diversity** that drives cities. This diversity is critical to promote and deliver innovation at multiple levels. Decision makers can provide specific forums for shared learning where diversity is celebrated, but also where diversity is mobilized to deliver neighbourhood-relevant innovations, which can be scaled up to achieve global impact.

Activating the transformative power of urbanization depends on the collective capacity to activate **points of intervention** that enable rapid transformations. Identifying those points of intervention depends on the shared understanding of the history and experiences of the urban environment. Decision makers have to work with leading changemakers and communities to find out what kind of radical changes can be fostered to add environmental value.

Technology and open data have opened new opportunities to enable collaborative networks within and across cities. This potential should not be overlooked, but they should not distract from well-established processes of collaborative planning and their potential to deliver environmental action.

The coordination of action across multiple levels of government and the formulation of national urban policy is central to ensure the delivery of the SDGs. Supported local governments will be able to develop transformative capacities to ensure sustainable urban futures for all. However, the absence of such coordination mechanisms should not detract from the growing urban movement seeking to deliver sustainability via local governments working in partnership with communities, citizens, businesses and NGOs. Adding environmental value through planned urbanization requires a commitment to long-term policies and practice directed towards building inclusive processes of decision-making that recognize and engage with urban complexity.

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