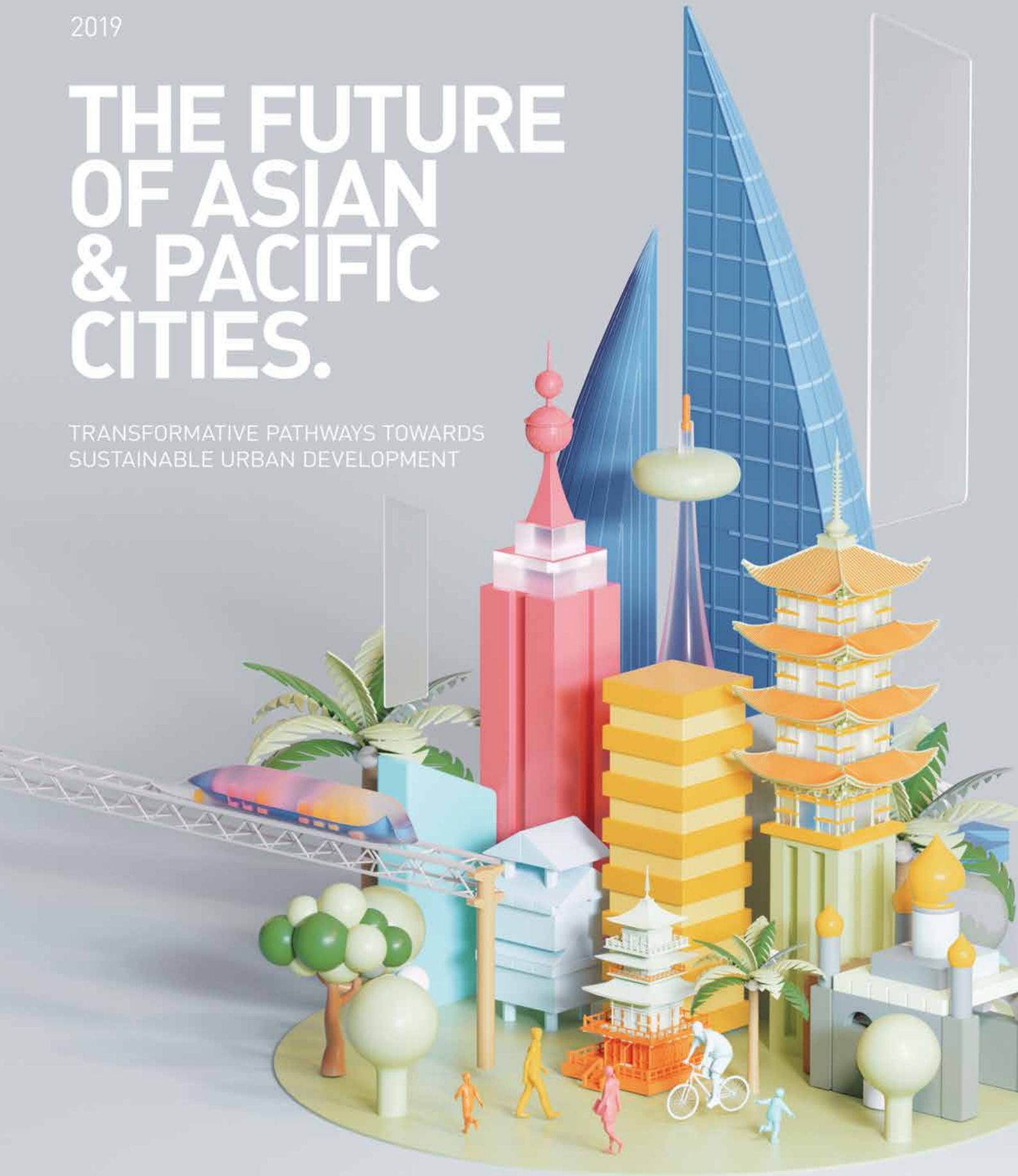


2019

THE FUTURE OF ASIAN & PACIFIC CITIES.

TRANSFORMATIVE PATHWAYS TOWARDS
SUSTAINABLE URBAN DEVELOPMENT



Empowered lives.
Resilient nations.



THE FUTURE OF ASIAN & PACIFIC CITIES.

TRANSFORMATIVE PATHWAYS TOWARDS
SUSTAINABLE URBAN DEVELOPMENT



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CONTENTS

INTRODUCTION

- . P6 FOREWORDS
- . P12 ABOUT THE REPORT
& ACKNOWLEDGEMENTS
- . P18 EXECUTIVE SUMMARY
- . P26 THE EMERGING ASIA-PACIFIC
URBAN FUTURE

1

The future of urban & territorial planning

- 1.1 The 2030 vision for urban and territorial planning . P42
- 1.2 Planning and planning frameworks are growing with increasing urbanization . P44
- 1.3 Future policy pathways for urban and territorial planning . P63

2

The future of urban resilience

- 2.1 The 2030 vision for resilient cities . P70
- 2.2 Taking stock of the region's resilience-building paradigms . P81
- 2.3 Future policy pathways for urban resilience . P90

.3

The future of smart & inclusive cities

- 3.1 The 2030 vision for smart and inclusive cities . P100
- 3.2 Smart city applications in the Asia-Pacific region . P104
- 3.3 Future policy pathways for smart and inclusive cities . P118

.4

The future of urban finance

- 4.1 The 2030 vision for urban finance . P130
- 4.2 Analysing the financing options for addressing the infrastructure gap . P134
- 4.3 Future policy pathways for urban finance . P148

CONCLUSION

- . P156 DEVELOPMENT PATHWAYS FOR A SUSTAINABLE URBAN FUTURE

- . P164 REFERENCES



FOREWORD

The Future of Asian & Pacific Cities

**Armida Salsiah
Alisjahbana**

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Sharif**

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FOREWORD

Armida Salsiah Alisjahbana

Under-Secretary-General of the
United Nations and Executive
Secretary of the United Nations
Economic and Social Commission
for Asia and the Pacific (ESCAP)



Cities and urban centres act as accelerators for social and economic progress in the Asian and Pacific region. The economic dynamism of our cities provides livelihood and social mobility opportunities not found in rural areas. Throughout history, cities have been hubs of innovation as the concentration of people, resources and ideas enables transformations to occur at tremendous speed, generating economic activity and wealth. However, cities are also home to significant concentrations of the poor and marginalized, and they have significant impacts on the environment and people's well-being.

As indicated by its title, *The Future of Asian and Pacific Cities*, the report takes a fresh, forward-looking approach. It focuses strongly on the Asia-Pacific region's urban future – on key issues and drivers of trends that need to be upscaled and accelerated to shape more inclusive, resilient and sustainable urban development pathways. The report outlines how such urban development pathways can be in line with the 2030 Agenda for Sustainable Development.

"A city should not just happen anymore. Every block, every building and neighbourhood requires careful planning. Cities can play a major role in supporting a more sustainable and inclusive future in our region. Yet, this depends on decisive action in cities and urban centres right across Asia and the Pacific — action which I hope this report can inform and support."

Five years into implementing this important international development framework, rapidly growing cities and towns are faced with a range of developmental choices that will shape their growth and long-term economic, social and environmental sustainability. Many of these are complex choices with differing short-term versus long-term costs and benefits. These choices are seldom determined by individual actors or agencies but emerge out of the complex interplay of decisions made by a range of actors across national and local governments, investors and entrepreneurs in the private sector, and a range of local community and civil society voices.

The report focuses on four essentials that cities must get right. Urban and territorial planning, strengthening resilience to future risks, supporting the effective interplay between people and technology, and financing tools, all of which are essential to deliver sustainable smart cities in our region. With three to five future policy pathways per chapter, the report offers ways to seize these opportunities and realize sustainable urban development by 2030. Regional cooperation and strong partnerships among all interested parties will be essential to

pool expertise, accelerate progress and deliver the integrated approach needed.

Many partners were brought together to produce this report, all galvanized by a common ambition to improve the sustainability of cities. These partners are uniquely positioned to assist cities to achieve their goals. I am grateful to the Asian Development Bank, the European Union, Singapore's Centre for Liveable Cities, The Rockefeller Foundation, the United Nations Development Programme and UN-Habitat, without which this ambitious joint publication on the future of sustainable cities in Asia and the Pacific would not have been possible.

A city should not just happen anymore. Every block, every building and every neighbourhood requires careful planning. Cities can play a major role in supporting a more sustainable and inclusive future in our region. Yet, this depends on decisive action in cities and urban centres right across Asia and the Pacific – action which I hope this report can inform and support.

”



FOREWORD

Maimunah Mohd Sharif

Under-Secretary-General of the United Nations and Executive Director of the United Nations Human Settlements Programme (UN-Habitat)



Wandering through the streets of George Town in Malaysia's Penang Island today, one is impressed with the high quality of life, but this has not always been the case. When I first started working as an urban planner in the then George Town Municipal Council in the 1980s, the city was on a downward trajectory, faced with the challenges of an industrializing State. However, the last two decades have seen Penang Island transformed into a green, innovative, inclusive city that has a powerful vision of its own future.

My Penang experience, while unique in many ways, is also representative of the wider Asia-Pacific urban experience. My mayoral colleagues managed fast-growing urban economies and had first-hand experience in the transformation of their cities and towns into vibrant hubs of development. This experience has been truly exhilarating. Cities in Asia and the Pacific will need a lot more of this "can do spirit" if we want to meet the targets of the 2030 Agenda for Sustainable Development and the transformative commitments of the New Urban Agenda.

"Cities in Asia and the Pacific will need a lot more of this 'can do spirit' if we want to meet the targets of the 2030 Agenda for Sustainable Development and the transformative commitments of the New Urban Agenda."

The challenge of fast-growing economies is that one day we will need to learn to slow down and make development sustainable. *The Future of Asian and Pacific Cities* report provides possible pathways to sustainable urban development. The report could not come any sooner as this year marks the first time that the majority of the region's population is living in urban areas. That is more than 2.3 billion people.

The 2019 report differs from the earlier editions, published in 2015 and 2011, which benchmarked urban issues by broad and deep analysis of the state of urbanization in the region. The present report is an attempt to reimagine the urban future. It projects a picture of a future that is prosperous, resilient and inclusive. It analyses possibilities for sustainable development by asking what kind of policy options could help cities in the region localize and meet the 2030 Agenda for Sustainable Development. The New Urban Agenda makes clear that cities play a key role as accelerators and innovators in inclusive, sustainable transformation of developing economies and societies. However, the decisions to choose sustainable pathways need to be acted upon today.

This report guides the reader to four key interlinked drivers critical for accelerated structural change that needs to happen to move the region's cities towards sustainability. This includes the integration of urban and territorial planning, strengthening multilevel governance and capacities for building resilience, the application of people-centric smart city innovations, and practical long-term financing solutions.

Finally, I would like to express my gratitude to our partners on the journey of producing this report: first, ESCAP, as well as the Asian Development Bank, the European Union, Singapore's Centre for Liveable Cities, The Rockefeller Foundation and the United Nations Development Programme, which in true partnership made this report possible by both their financial and intellectual commitments to guiding the sustainable turn of urban development directions in Asia and the Pacific.

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ABOUT THE REPORT & ACKNOWLEDGEMENTS

**The Future
of Asian
& Pacific Cities**

ABOUT THE REPORT & ACKNOWLEDGEMENTS

The Future of Asian and Pacific Cities report 2019 is an important resource to explore critical and emerging policy opportunities to realize urban sustainability for the Asian and Pacific region. The report informs policies and actions from a sustainable development perspective, putting cities at the centre of development policy debates. The report identifies future policy pathways for urban decision makers and stakeholders to reimagine the built and natural environments in Asian and Pacific cities and offers policy solutions across different types of cities to achieve the global development agendas. The solutions address four major development challenges — natural resource management, climate change, disaster risk and inequalities — through a focus on the key means of implementation to accelerate the achievement of the 2030 Agenda for Sustainable Development. As a policy advocacy report, it explores how the transformative potential of cities can be harnessed and enhanced to forge inclusive, prosperous and resilient cities, and how cities can serve as the drivers of sustainable development for the achievement of the New Urban Agenda in the Asia-Pacific region. The report builds on two previous publications, *The State of Asian and Pacific Cities 2015* and *The State of Asian Cities 2010/11*, which explored the key existing and emerging trends in urban development within the region. This report, on the other hand, employs a forward-looking perspective with an ambitious vision of a sustainable urban future for the region, and evaluates the implications of different development pathways for the achievement of inclusive sustainable development in cities by 2030.

The report was jointly developed by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the United Nations Human Settlements Programme (UN-Habitat). It was prepared under the direction of Stefanos Fotiou, Director of the Environment and Development Division, ESCAP, Curt Garrigan, Chief of the Sustainable Urban Development Section, ESCAP; and Raf Tuts, Director of the Programme Division, UN-Habitat, and Atsushi Koresawa, Director, Regional Office for Asia and the Pacific, UN-Habitat.

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- Subregional consultation for the Pacific, hosted by the ESCAP Subregional Office for the Pacific and the University of the South Pacific, in Suva, in July 2018.



- Expert group meeting on smart cities, hosted by ESCAP and Singapore's Centre for Liveable Cities at the 2018 World Cities Summit, in Singapore, in July 2018.



- Local government consultation at the 7th Congress of United Cities and Local Governments in Asia and the Pacific, hosted by ESCAP and UN-Habitat, in Surabaya, Indonesia, in September 2018.



- Subregional consultation for North and Central Asia, hosted by the United Nations Economic Commission for Europe, ESCAP and UN-Habitat, in Geneva, in October 2018.



- Subregional consultation for South and South-West Asia and Expert Group Meeting on municipal finance hosted by the ESCAP Subregional Office for South and South-West Asia and NITI Aayog, Government of India, in New Delhi, in November 2018.



- Expert group meeting on urban resilience, hosted by ESCAP, the European Union and The Rockefeller Foundation, in Bangkok, in November 2018.



- Expert group meeting on urban and territorial planning, hosted by UN-Habitat, UNDP, ESCAP and Nanjing University, in Nanjing, China, in February 2019.

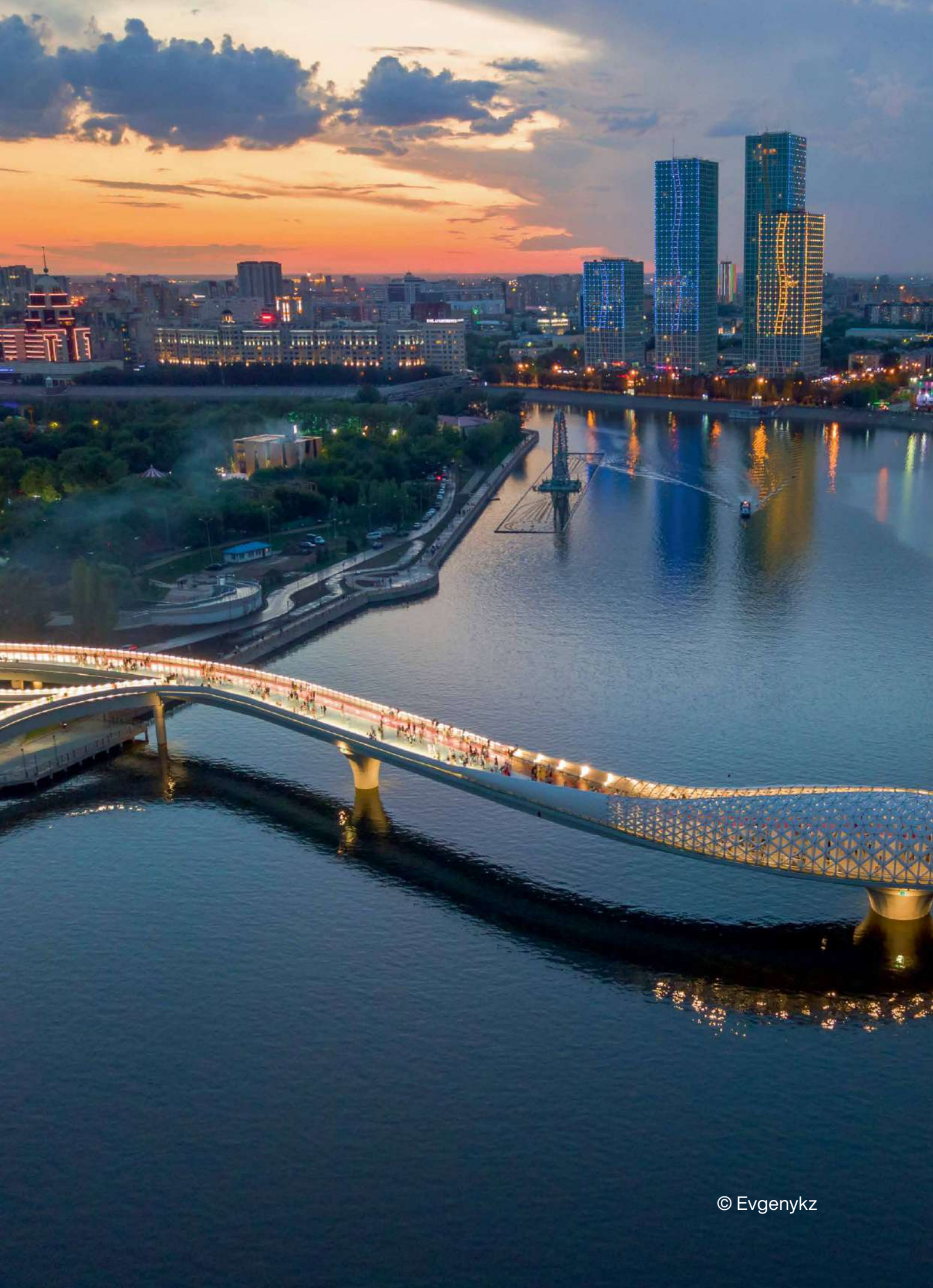
These in-person consultative meetings were combined with numerous webinars and virtual consultations with experts and stakeholders.

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EXECUTIVE SUMMARY

The Future
of Asian
& Pacific Cities

EXECUTIVE SUMMARY

The Asian and Pacific region became majority urban in 2019 for the first time in human history. With more than 2.3 billion people in the region living in cities, the need for a sustainable urban future has never been greater. *The Future of Asian and Pacific Cities* is the third in a series of reports on urbanization in Asia and the Pacific. Unlike the report's previous two iterations, this report is intentionally forward-looking and charts 15 policy pathways that can guide future urbanization in the region in order to deliver on the 2030 Agenda for Sustainable Development and the New Urban Agenda.

While recognizing that the Asia-Pacific region is exceedingly diverse, ranging from small island developing States to powerful global economies, the report identifies four major development challenges across the region: natural resource management; climate change; disaster risk; and rising inequalities. These four overarching challenges are endemic to the region, from the spillover impacts of forced migration across Western Asia to the existential threat of sea level rise in the Pacific islands.

These challenges are woven throughout the report, which in turn identifies four aspects of city-making that organize the report's policy pathways: urban and territorial planning; urban resilience; smart and inclusive cities; and urban finance. Together, these competencies are the components of today's increasingly complex cities. Getting all of them right can help transition cities towards a sustainable and inclusive future, well positioned to weather the challenges and seize the opportunities of the next several

decades – a period that will witness both heightened impacts of global climate change as well as the proliferation of exciting new technologies that will reshape how people live, work and play in cities.

The cities of 2030, 2050 and 2100 will be very different from today. They will be cities transformed: in their demographic composition, in their implementation of technology and in their wider ecological contexts. The challenges of building cities sustainable enough to meet the changing needs of the future will require new ways of thinking and working, as well as new kinds of multi-stakeholder initiatives and partnerships. Learning to ask new and better questions, and building new approaches to tackling old problems, will be the role of any stakeholder, private or public, looking to be part of the solutions to these challenges.

As presented here, the report makes the case for four priorities and four approaches to realize a sustainable urban future in Asia and the Pacific, each of which contain specific policy pathways. A sustainable future occurs when planning lays a foundation; resilience guards against future risk; smart cities deploy the best technology for the job; and financing tools help pay for it all. Getting these essentials right in cities today is vital in order to adapt to the demands of tomorrow.

The report opens with urban and territorial planning, the necessary prerequisite for creating a city's future vision. This first chapter contains an overview of the state of planning in the region, acknowledging recent successes in Indonesia,

"A sustainable future occurs when planning lays a foundation; resilience guards against future risk; smart cities deploy the best technology for the job; and financing tools help pay for it all."

Malaysia, the Philippines, and other Asian countries in areas such as strengthening local planning and developing national systems of cities, even as the region as a whole struggles to make effective planning systems a cornerstone of national policy, as China did in 2018. It notes the Asian and Pacific cities that have risen to the top of global liveability rankings and the peer influence of planning education and institutes in Australia, Japan, the Republic of Korea and Singapore. Chapter 1 offers three policy pathways:

The future of urban & territorial planning



.01 Integrate sustainability and quality-of-life targets into urban planning to future-proof public and private investment in cities



.03 Identify specific urban regeneration and growth strategies that optimize urban-rural and city region collaborations that spur sustainability and investment



.02 Co-produce with citizens urban planning solutions that align technological investment with adequate local government capacities

In the light of the uncertain environmental, social and economic future facing Asian and Pacific cities, the report then turns to urban resilience, or a city's ability to respond to shocks and stresses. Chapter 2 highlights the extensive resilience activities that have taken place thus far in the region, from the number of cities that have tasked high-ranking city officials with this cross-cutting topic to those that have prepared resilience

strategies and climate action plans. The chapter scans the major shocks and stresses likely to afflict the region, from natural disasters, such as typhoons and earthquakes, to economic reliance on single industries in the face of the "Fourth Industrial Revolution", to an ageing population set to follow the greying trends of Japan and the Republic of Korea. The chapter concludes with the following policy pathways:

The future of urban resilience



.04 Scale up the use of nature-based solutions and resilient infrastructure in integrated urban and climate change planning



.05 Understand the informal economy and support urban poor groups to be change agents for implementing city-resilience actions



.07 Utilize big data sources to connect communities, cities and regions and to improve local government technological literacy



.06 Create and strengthen partnerships to bring more attention and resources to long-term urban resilience strategies that break siloes between national, state and local actors

The twenty-first century’s digital revolution has undeniable implications for cities, which are captured in chapter 3 on smart and inclusive cities. Asian and Pacific cities have been at the forefront of adopting smart city key performance indicators and plans, as has been done in Goris, Armenia, combined with new technologies to manage city services, as evidenced by new forms of collaboration, such as the ASEAN Smart Cities Network. The region is a hub of both tech-savvy citizens, characterized by high levels of smartphone penetration, and centres for high-tech industries, such as the start-up culture of Bengaluru, India’s answer to Silicon Valley. However, the chapter also acknowledges the potential limitations and drawbacks of an overreliance on technology, from a failure to address the digital divide to the need to regulate the use of technology in order to protect citizens’ privacy. The chapter makes the following policy pathway recommendations:

The future of smart & inclusive cities



.08 Improve smart city governance across urban systems, institutions and actors to overcome inequalities and make more informed and integrated planning decisions



.09 Encourage technology firms to become more civic minded and create sustainable smart city solutions with social enterprises



.10 Adopt cybersecurity safeguards in both digital and physical urban infrastructure development planning



.11 Develop smart mobility investment plans that prioritize sustainable urban mobility options for citizens

Finally, the report acknowledges that no city will succeed without the ability to finance its development and infrastructure needs sustainably. To that end, the report concludes with chapter 4, which is focused on urban finance. While finance is a complex world with potentially endless possibilities, the report takes a practical approach by narrowing down the key types of finance that are most likely to offer sustainable and inclusive solutions for the region's diverse economies and governance structures, which influence the degree to which cities can raise revenue. Specifically, the chapter analyses the potential of public-private partnerships (PPPs), targeted environmental levies or charges, land value capture mechanisms, municipal pooled financing and climate funding sources in cities as diverse as Suva in Fiji, Tra Vinh in Viet Nam and Kolkata in India. The chapter concludes by offering the following policy pathways:



.12 Expand viable smart city funding mechanisms by enabling cross-sector partnerships and business matching platforms

The future of urban finance



.13 Scale up public-private partnerships and community schemes to transition to localized housing finance solutions



.14 Adopt land-linked financing mechanisms that leverage urban growth to build people-centred urban infrastructure



.15 Introduce congestion-charging and environmental user fees to improve urban air quality



"Taken together, these policy pathways comprise a guidebook for future urbanization in Asia and the Pacific."

To realize the future vision of inclusive, safe, resilient and sustainable cities will require focused efforts on the thematic priorities in this report. The approaches to which all urban stakeholders must contribute are clear:



1. Plan the foundations of a sustainable future. All cities must strengthen their capacities, adopt inclusive planning processes and develop long-term spatial and investment plans that effectively consider urban growth, quality-of-life goals, resource implications and smart approaches.



2. Guard against future risks. To ensure sustainable growth and development, it is critical that cities adopt resilience strategies that break down governance siloes to improve policy efficacy, provide opportunities to scale up nature-based infrastructure solutions, and engage the creativity of the urban poor as solution providers to guard against potential shocks and stresses, including natural disasters.



3. Capitalize on frontier technologies to develop people-centred smart cities. City leaders must develop smart cities road maps across different urban systems that capture the innovation of technological entrepreneurs, bridge the digital divide, support smart mobility and include the perspectives

of local stakeholders, while ensuring their safety.



4. Mobilize financing to invest in sustainable urban solutions. Local governments must access or adopt innovative investment tools, such as land value capture instruments, PPPs and environmental user fee models. These can serve as important levers to catalyse economically impactful capital investments that create long-term value for citizens, businesses and the city as a whole.

Taken together, these policy pathways comprise a guidebook for future urbanization in Asia and the Pacific. While not every policy pathway will prove applicable to every city in the region – a near impossibility given the size, scale and diversity found in Asia and the Pacific – this collection of policy pathways endeavours to offer the best summation of cutting-edge urban thinking as the region's cities are poised to enter the critical final decade to deliver on the Sustainable Development Goals. If the 2019 demographic milestone that has made Asia and the Pacific a majority urban region is a potential tipping point, then this report and these policy pathways are designed to tip the scales in the right direction towards creating sustainable, resilient and inclusive cities for all.

In this context, the report can be used to launch a dialogue in the city. If there are no mechanisms for stakeholders to come together and discuss the local urban future, one should be created, such as a local urban forum, an online platform



to discuss the city or a media campaign that promotes civic conversation. No city will fare well with a top-down, go-it-alone approach. To that end, this report will serve as a vital road map to the next decade of Asia-Pacific urbanization, from booming intermediate cities to ageing legacy cities, and serve as a reference for how to shape urbanization while heading into the crucial 2020-2030 window.

The depth of these concepts can at first appear overwhelming in their scope, but this report endeavours to cut through the noise of

sustainable urban development and focus on the four major areas that cities must get right if they wish to deliver on the Sustainable Development Goals and the New Urban Agenda in the coming decade.

Wherever a city is on its progression, it is never too late to embark on the path to a sustainable city.



THE EMERGING ASIA-PACIFIC URBAN FUTURE

**The Future
of Asian
& Pacific Cities**

THE EMERGING ASIA-PACIFIC URBAN FUTURE

Stories of Asian & Pacific cities today

When heavy rains come in May, residents of neighbourhoods surrounding Wuhan's Garden Expo in China no longer brace themselves for overflowing sewage as they had done in the days when this 46-hectare site formed the Jinkou landfill, Asia's largest garbage dump. After a three-year remediation programme, the trash heap, the methane emissions of which regularly caught on fire, had been transformed so that it opened to host the 10th China International Garden Expo in September 2015. This urban ecological restoration project converted a once toxic part of Wuhan, a city of 11 million people, into an award-winning green oasis that creates public space, improves air quality, provides habitat for native wildlife, adapts to climate change and operates on a sustainable financing model (Xinhuanet, 2018; C40 Cities, 2016).¹ Employing "sponge city" principles, the Garden Expo site can absorb Wuhan's subtropical monsoon rainfall (Jing, 2019). According to the Intergovernmental Panel on Climate Change (IPCC), monsoon rainfalls are expected to become more intense as climate change creates more extreme weather events (Stocker and others, 2013). While the project cost \$690 million, the improvements benefit 400,000 residents in the park's immediate surroundings, and the municipal government collects revenue from such events as wedding rentals that help recoup the city's investment.

Every Monday, a student from a Surabaya, Indonesia, kampong (village) prepares for another week of university studies. She pays for her tuition with income from a home-based business making sarongs that she runs with her family, which received seed funding from the city's Kampong Flagship Programme. The student heads to the nearest bus stop toting plastic bottles that she picked up in the alleys of her kampong, which has been improved with water and sanitation infrastructure under the city's Kampong Improvement Programme. When the bus comes, she deposits the plastic bottles in lieu of a cash fare payment. The bus doubles as a recycling collection point under the city's 3R programme. Instead of installing recycling collection bins and procuring recycling collection vehicles, the programme incentivizes citizens to collect recyclable materials on their own and the public buses double as transport for the material back to a central depot (Urban Redevelopment Authority Singapore, 2018). The Department of Cleanliness and Green Open Space manages the 3R programme with funding from its annual budget for urban waste disposal, but relies on community participation and a private sector market for plastic waste to ensure the financial viability of the programme (Secretariat of Guangzhou International Award for Urban Innovation, 2018a).

¹ The financing model is sustainable as it maximizes ecosystem services and environmental/social/economic co-benefits. The model saved \$125 million compared with conventional restoration methods.



Traffic managers in Aqkol monitor the streets in real time from an operations centre in Kazakhstan's first smart city, leading to reductions in streetlight energy usage and drunk driving (Yergaliyeva, 2019). City planners in Sydney are successfully financing real estate worth A\$13 billion in Australia's largest urban redevelopment project through a value capture scheme that will transform a 278-hectare brownfield site into a mixed-use neighbourhood for 61,000 residents and 21,000 workers by 2030 at a time when the city is facing an acute space crunch (Secretariat of Guangzhou International Award for Urban Innovation, 2018b). The government in Port Moresby balances the municipal budget without having to plead for emergency funds from the Papua New Guinea Government because urban building taxes, business license fees and market stall charges have made the municipal government largely fiscally self-sufficient, enabling the city to invest in public services with the confidence that the necessary funds will be available (Keen and others, 2017).

These contemporary slices of life from cutting-edge innovations in Asia-Pacific cities could be a harbinger of the region's sustainable urban future. Tackling climate resilience and social issues simultaneously with creative financing streams and streamlined municipal governance are examples of the bold public policy interventions the region will need between now and 2030 if it hopes to meet the United Nations Sustainable Development Goals. Fortunately, every subregion in the vast Asia-Pacific region has demonstrated the type of action necessary to deliver on this ambitious agenda. These illustrative stories highlight also how innovative interventions and policies led by local governments and supported by national Governments, the private sector and civil society can combat urban sustainability challenges and change people's lives for the better in Asian and Pacific cities.

However, these encouraging examples contrast with other stories where action to address urban challenges is lagging behind, hampered by national mandates or affected by national and international crises.





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“Day Zero” struck Chennai, India, in June 2019 when the city’s reservoirs ran dry in a crisis created by poor water management (World Resources Institute, 2019).² In October 2018, a combination earthquake and volcanic eruption in quick succession strained Indonesian first responders in Palu to the breaking point and highlighted the need to continue to build local government capacities to respond to such disasters learning the lessons from the 2004 Indian Ocean tsunami (Kapoor, 2018). In Jakarta, hawkers have watched their city sink and the sea level rise in real time as the city struggles to adequately manage the water distribution network’s capacity and supply (Kimmelman, 2017).

Peak hour commuters in Bangkok experience one of the worst traffic congestions of any Asia-Pacific city. Idling vehicles contribute to air pollution, a regional problem, and create a drain on economic productivity and quality of life as Bangkok commuters spend a significant amount of time sitting in congestion (INRIX, 2018). Chinese “ghost cities” built to accommodate an anticipated population may result in long term debt liabilities for the city (Shepard, 2015). Economic and social disparities in urban populations continue to grow, as the absolute number of urban slum dwellers is increasing in parallel with the fast pace of urbanization (ESCAP and UN-Habitat, 2015).

The future of Asian & Pacific cities

These extremes of everyday reality in Asian and Pacific cities highlight the present and portend the future because they are the outcomes of decisions taken and not taken in the past in the face of myriad other decisions and events. The current status of Asian and Pacific cities is one of enormous economic growth and rapid urbanization, putting the region at the forefront of urban innovation challenges. These

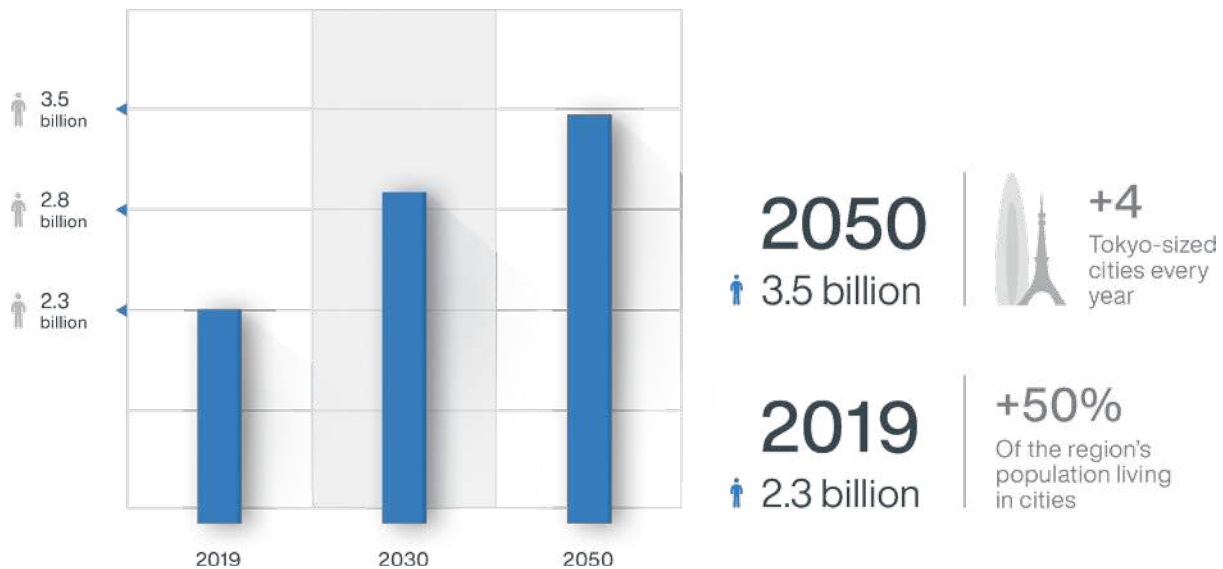
snapshots of life in cities are complemented by some challenging facts and figures regarding the present and the future of urbanization in the region.

United Nations demographers estimate that Asia and the Pacific became majority urban for the first time in history in 2019 with more than 50 per cent of the region’s population living in cities. The

² For details, see www.wri.org/blog/2019/06/how-does-flood-prone-city-run-out-water-inside-chennai-day-zero-crisis.

Figure 1

Projected urban population in Asia and the Pacific, 2019 to 2050



Source: United Nations, 2019.

region's urban population exceeded 2.3 billion, comprising 54 per cent of all urbanites on the planet. The region's number of urban dwellers is expected to rise to more than 2.8 billion in 2030 and reach nearly 3.5 billion in 2050 (see figure 1). Those numbers equate to adding four Tokyo-sized cities every year (United Nations, 2019).

While the number of urban dwellers is increasing, the urbanization rate is projected to plateau in the future. Japan is already experiencing a decline in its urban population; by the 2040s, the urban population of the Republic of Korea is expected to do the same. China's rate of urbanization will flatline by 2050 as well, leading to a first-ever decrease in East Asia's urban population. However, Central, South-West and South-East Asia are expected to become more urban over the next three decades, albeit at slower rates than in recent decades (United Nations, 2019).

The region's cities are dense by global standards, with an average of 10,000 to 20,000 people per square km. Such densities are about double those in Latin America, triple the rates in Europe, and reach some 10 times higher than those in

North American cities (ESCAP and UN-Habitat, 2010). The Asia-Pacific region is home to the largest concentration of people experiencing urban poverty, with one third of urban dwellers living in slums or slum-like conditions (ESCAP and UN-Habitat, 2015). Improving access to inclusive, high-quality services in the region's existing dense cities and ensuring that planned urban extensions meet similar standards are essential steps for cities to accommodate growth without consuming excessive amounts of undeveloped land. In short, well-planned cities should aim to grow upward rather than outward (UN-Habitat, 2017b).

Across the Asia-Pacific region, this trend plays out differently according to the latest research by the World Resources Institute, which in 2019 analysed cities in the Global South³ by comparing their upward and outward expansion as related to current and future city prosperity. Central Asian cities are not growing very much upward or outward. South Asian cities are largely growing outward more than upward. South-East Asian cities exhibit a similar trend but at a lesser rate. East Asian cities, most notably in China, are

³ The Global South is made up of Africa, Latin America, the Middle East and the developing countries of the Asia-Pacific region, and is home to the so-called BRIC countries: Brazil, the Russian Federation, India and China, which, along with Indonesia, are the largest Southern States.

"The addition of 1.2 billion new residents in Asia-Pacific cities between now and 2050 will have profound implications for the region's economy, society and environment."

growing both upward and outward. The end result for the region is a mixture of what is referred to as "emerging cities", which have low income today but expected high-income growth relative to population growth in the period 2015-2030, and "thriving cities", which have both high income today and expected high incomes into the future, until 2030. Australian cities buck this trend and are considered "stabilizing cities" with high income today that will become low-income growth relative to population growth in the future. However, the region has very few "struggling cities" with low income today and similarly low income projected into the future (Mahendra and Seto, 2019). Finally, Pacific island cities consist of those characterized by a mix of densities and sprawl in Melanesian and Polynesian urban villages, while many countries in Micronesia are considered to be 100 per cent urbanized.

The addition of 1.2 billion new residents in Asia-Pacific cities between now and 2050 will have profound implications for the region's economy, society and environment. These residents will need jobs offering decent work in order to avert social unrest. They will need affordable housing with transport links to avoid the proliferation of slum-like conditions and urban sprawl that consumes agricultural and natural land. They will need the necessary water and sanitation infrastructure to prevent environmental degradation and public health risks. They will need to harness the potential of disruptive, digital innovations to drive positive social change. While the pace of urbanization will be slower than in decades past, the estimates still indicate fairly rapid urbanization in Central Asia, South

and South-West Asia, South-East Asia and the Pacific, a trend that can risk overwhelming cities' capacities to adequately plan for growth (United Nations, 2019). In a few cases, the opposite problem will require attention: dwindling urban populations risk creating shrinking cities with decaying or abandoned infrastructure. Similarly, a contracting tax base would undermine social stability and exacerbate community vulnerabilities.

The region's urban economies have developed through largely environmentally exploitative models. Rapid, inefficient and unplanned urbanization along with unsustainable consumption patterns and changes in lifestyle over recent decades together have predominantly resulted in environmental degradation, loss of biodiversity, increased pressure on natural resources, generation of waste, exposure to pollution and disasters, and vulnerability to climate change, all of which require urgent integrated responses and political action. Significant amounts of marine pollution are the result of land-based activities, such as pollutants from waste, sewage and wastewater. While the vast share of this pollution still consists of organic matter, over time waste streams are becoming more complex and non-biodegradable and containing ever more toxic components, including e-waste (ESCAP, 2018c).

A sustainable future for cities in the region is needed more than ever. City stakeholders, including elected leaders and private sector players, can be inspired by and rely for strategic visioning of such a future on the five



global agendas adopted by the international community between 2015 and 2016 (see box 1). National and local governments and other stakeholders have been working the last five years on translating the aspirational character of these agendas into operational actions. There are several areas that need to be addressed in such an operationalization process; it is difficult to predict the outcome of processes that are by their nature as complex and stochastic as that of sustainable urbanization. However, instead of attempting to predict the future, more value can be found in defining a science and expertise-based framework that can make this future a sustainable one.

Such a framework starts with the obvious assumption that the future of cities in the region will be determined by decisions on how to manage the demographic, environmental and economic conditions, such as the ones described above. Adaptive responses to tackle problems created by, and proactive measures to benefit from, external and internal drivers of change will define the character of such a future. These responses and measures will constitute specific pathways on which the cities in the Asia-Pacific region will embark towards their future.

To ensure that these pathways will be sustainable, an initial focus should be on defining a small set of systemic issues that seem currently to bar cities in Asia and the Pacific from becoming sustainable. After extensive consultation between experts, the team that developed this report has selected the following four issues as the most critical ones: *natural resource management*; *climate change*; *disaster risks*; and *inequalities*. These issues are integrated throughout the report's substantive chapters. While these major trends are not an exhaustive list of development challenges, by successfully tackling these four major issues, Asia-Pacific cities will have overcome some of their greatest challenges for achieving sustainable development by 2030. In other words, these issues constitute "common problems" facing all cities in Asia and the Pacific.

Consciously, the same team has opted not to use these challenges as the framing for the report's substantive chapters but to use instead a solutions-based approach, according to the framework described in the next section.

. BOX 1**Towards 2030 and beyond: United Nations global agendas and cities**

The world is now five years into an important suite of global agreements that underpin the global path to sustainable development for the next several decades. Importantly, for the first time, cities are seen as engines of sustainable development rather than obstacles in the fight against poverty, hunger and climate change.

In chronological order, the first of these global agreements is the *Sendai Framework for Disaster Risk Reduction 2015-2030*, adopted at the Third United Nations World Conference on Disaster Risk Reduction in Sendai, Japan, in March 2015. The agreement acknowledges that responsibility to reduce disaster risk should be shared with other stakeholders, including local governments and the private sector. Specifically, the framework highlights the role of land use and urban planning, building codes and environmental and resource management regulations, and acknowledges the role of United Cities and Local Governments and other relevant local government bodies as necessary to support implementation of the framework (United Nations Office for Disaster Risk Reduction, 2015).

The second agreement is the *Addis Ababa Action Agenda*,^a adopted in July 2015. The Agenda underscores the necessity for new financial architecture that can support the global sustainability agendas. It explicitly recognizes and supports the role of local governments and calls for domestic public resources, domestic private finance, international private finance, international development cooperation and sustainable debt to help meet the estimated \$1-1.5 trillion annually need to fill the infrastructure gap in developing countries.^b

The third global agreement is the *2030 Agenda for Sustainable Development*,^c also known as the *Sustainable Development Goals*, which were adopted by the United Nations General Assembly in September 2015. Unlike the Millennium Development Goals, the Sustainable Development Goals apply to all countries, both developed and developing, and set bold, aspirational goals, such as eliminating poverty, ending hunger and ensuring universal primary and secondary education. While the Millennium Development Goals had only one target with an urban focus – to achieve substantial improvement in the lives of a minimum of 100 million slum dwellers by 2020 – the Sustainable Development Goals dedicate an entire goal to cities in Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable. Goal 11 recognizes for the first time that urbanization is a transformative force for development and cities should be enabled to take the lead in addressing many global challenges. Most of the 234 statistical indicators to measure global progress towards the Sustainable Development Goals have an urban dimension and about one third of the Goals' indicators are measured at the local rather than national level (UN-Habitat, 2018). In short, any country serious about meeting its obligations to achieve the Sustainable Development Goals will find the path to sustainable development runs through its cities (UCLG, 2018).

The fourth major convention is the *Paris Agreement on climate change*,^d which was adopted in December 2015. In Paris, countries pledged to voluntarily reduce their greenhouse gas emissions in order to keep the mean global temperature rise below 2°C and ideally below 1.5°C from pre-industrial levels (United Nations Framework Convention on Climate Change, 2016). Since the agreement was negotiated, 194 States and the European Union have signed on. However, the United States of America has since declared its intent to leave the agreement and the Russian Federation has not yet ratified it. While the reluctance of these major emitters to join the global community has raised concern about the long-term viability of the Paris Agreement, various United States cities and local governments have communicated their intention to adhere to the



terms of the agreement in the hope of keeping the country's emissions in line with the nationally determined contribution that Washington agreed in 2015 (America's Pledge, 2017). Some cities, meanwhile, have seized on the Paris Agreement as a platform to argue for the importance of local level action to combat climate change. Scientists have estimated that cities emit at least 70 per cent of the world's carbon emissions, and likely more when accounting for goods and services produced elsewhere but destined for urban consumers (C40 Cities, 2018b). In 2018, the C40 Cities, a network of cities pushing climate action, announced that 27 major global cities had peaked their greenhouse gas emissions and begun showing decreases over the last five years in their total carbon footprint (C40 Cities, 2018a).

The fifth agreement is the *New Urban Agenda*,^e adopted in Quito, in October 2016. The New Urban Agenda sets out a 20-year vision to achieve sustainable cities that are well planned, regulated and financed. The New Urban Agenda supports the previous three agreements by offering a road map for implementing Sustainable Development Goal 11 and enhancing the role of cities in creating sustainable development, fighting climate change and reducing disaster risk. It calls for compact cities, polycentric growth, transit-oriented development, adequate public space and reining in sprawl. The New Urban Agenda was adopted as a collective vision and political commitment to promote and realize sustainable urban development, and as a historic opportunity to leverage the key role of cities and human settlements as drivers of sustainable development in an increasingly urbanized world.

^a General Assembly resolution 68/204.

^b General Assembly resolution 69/313.

^c General Assembly resolution 70/1.

^d Framework Convention on Climate Change Conference of the Parties decision 1/CP.21.

^e General Assembly resolution 71/256.

"The world must accelerate action on climate change and sustainable development, and cities should be the drivers of that action."

Objective & approaches

The main objective of this report is to provide a set of actionable “common solutions to common problems” as a guide to what the region’s sustainable urban future could look like in line with the United Nations global agendas: 2030 Agenda for Sustainable Development; Paris Agreement on climate change; New Urban Agenda; Addis Ababa Action Agenda; and Sendai Framework for Disaster Risk Reduction. The report outlines how city leaders in municipalities and metropolitan areas of all sizes can achieve those outcomes by working with partners at a global scale, such as international non-governmental organizations; at the national level with provincial governments; and at the local scale with local authorities and civil society. Such partnerships will enable cities to make the right key investments, actions and decisions in urban and territorial planning, urban resilience, data and technologies for smart sustainable cities and urban finance.

A business-as-usual approach will not enable the transformation required to meet the global agendas described above. Cities must therefore effectively implement solutions addressing the vital thematic areas covered in this report with the tools and resources to develop compelling future identities and visions. Above all, cities must make the right policy choices and *act now* to establish themselves on positive trajectories towards sustainable urbanization patterns. This responsibility is shared by all urban stakeholders

and the people who have a right to shape the urban future. The world must accelerate action on climate change and sustainable development, and cities should be the drivers of that action.

There are several key determinants for cities to drive that action and to meet the vision of the New Urban Agenda and successfully localize the Sustainable Development Goals in the Asia-Pacific region. These include but are not limited to: more sustainable integrated urban and territorial planning; stronger multilevel governance and capacities for resilience; adaptable technological innovations with systematic data collection and analysis; and adequate and predictable long-term financing. These four key determinants have been selected as the report’s chapters in order to identify a set of “common solutions to common problems” and provide city leaders with relevant future development pathways. In order to enable Asian and Pacific cities to become leaders and innovators in the effort to align cities on the trajectory towards sustainable development, this report offers four interlocking themes arranged as follows:

The future of urban & territorial planning

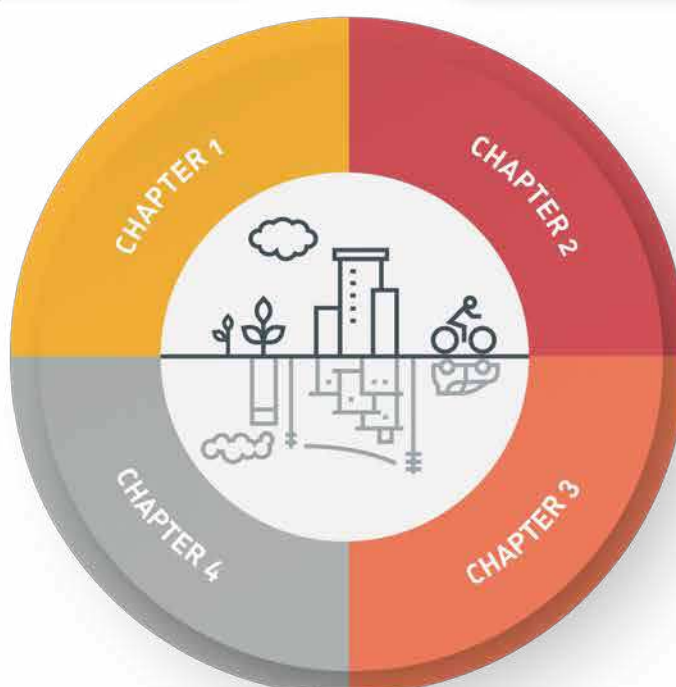


Any future vision begins with a plan. This chapter looks at how innovations in spatial planning can address social, cultural, environmental and economic challenges in cities comprehensively through regulatory and national spatial frameworks and applying new technologies.

The future of urban resilience



Addressing environmental, social and economic shocks and stresses today will safeguard city futures for all. This chapter pinpoints which resilience efforts must be scaled up for cities to grow sustainably within planetary boundaries while embracing technological, social and global change in a way that supports local resilience solutions.



The future of urban finance



The road forward to finance the future Asia-Pacific sustainable city is challenging but not impossible. This chapter provides policymakers with a practical basic agenda to leverage capital from public and private actors, which would promote scale and sustainability to meet their future infrastructure needs.

The future of smart & inclusive cities



Technological shifts ushered in by the "Fourth Industrial Revolution" are transforming and will continue to transform the way people in cities connect with one another, conduct business, provide services and live their lives. This chapter unpacks smart technological advancements and the institutional systems required to support inclusive smart city development, highlighting both opportunities and pitfalls for cities to make informed decisions effectively.

"Planning lays a foundation, resilience guards against future risk, smart cities deploy the best technology for the job and financing tools help pay for cities to achieve the 2030 Agenda for Sustainable Development."

With just three to five future policy pathways per chapter, the report offers a manageable road map to tackle these urgent challenges now and chart the right course for 2030.

None of these four issues, however, can be considered in isolation, but rather must be treated as interconnected topics. The concluding chapter on *development pathways for a sustainable urban future* unites the four main themes and reinforces the messages that planning lays a foundation, resilience guards against future risk, smart cities deploy the best technology for the job and financing tools help pay for cities to achieve the 2030 Agenda for Sustainable Development.

Unlike a report that solely addresses the state of today's cities in an effort to capture the status quo, this third edition of the report on Asia-Pacific cities acknowledges the past but places a strong emphasis on future conditions and solutions. That ambition to forecast future trends and offer solutions to head off future challenges is incorporated into the present report. Each thematic area presents a vision and follows it by exploring the implications of different transformative development pathways regarding the achievement of that vision for inclusive sustainable development in cities towards the horizon of 2030. The chapters are focused on assessing current challenges and presenting future solutions. These drivers of urbanization dynamics can in turn be met with the means to implement policies and programmes that will create results.

The report goes one level beyond identifying pathways for each individual key area. The most effective municipal policies and programmes are mutually reinforcing across these four areas and others, depending on the context. Cities need to be aware of the unintended consequences of their actions and therefore should pursue integrated, synergistic approaches. For example:

- Spatial planning integrating sustainability succeeds in reducing the vulnerability of people living in areas highly susceptible to extreme weather events, thereby increasing their resilience to climate-induced disasters
- Innovative proxy indicators for Sustainable Development Goal targets in the city can fill a key gap for smart governance to take place, notably for planning of housing and services for the urban poor living in informal settlements
- Access to adequate and predictable finance allows for the implementation of long-term planning and infrastructure decisions that can result in systemic reduction of vulnerability to environmental, social and economic shocks and stresses

These interlinkages underscore the importance of not just getting one theme right, but all four. Cities are complex systems that function best when overlapping priorities are addressed in an integrated manner. Attempting to solve housing, transport, solid waste or any other fundamental urban issue in isolation is a recipe for failure. As the World Economic Forum argued, "The future



of Asia-Pacific cities is one where city leaders take an integrated approach in urban and territorial planning and are increasingly agile and flexible in their urban management to respond to unforeseen future needs” (World Economic Forum: Global Future Council on Cities and Urbanization, 2018).

In Asia-Pacific, the sustainability of cities will determine the future development pathways for the region and the prospects for shared prosperity for all. Social, environmental and economic changes are not abstract national issues; they are played out locally in urban areas throughout the Asia-Pacific region. Urban challenges do not occur within a vacuum, meaning more strategic approaches to implementation are needed to overcome potential disconnections between short-term planning horizons and long-term outcomes of decisions across the environmental, social and economic spheres of sustainable development. Even so, it is still important to

recognize the importance of solutions which embody country-specific scenarios and meet the specific challenges which need addressing in that country. Cities need to make decisions now about how they want to develop and what means of implementation they intend to pursue towards their future objectives – how they plan, build resilience, finance and deploy smart technologies for the benefit of all.

If those tasks are done right, cities will have a transformative potential that can be harnessed and enhanced to forge inclusive, prosperous and resilient places. As home to the majority of the world’s urban population, Asian and Pacific cities can serve as the drivers of sustainable development for the implementation of the 2030 Agenda. How can they be such protagonists for global sustainability? Any future vision must begin with a plan.



CHAPTER 1



The future of urban & territorial planning

- . P42 **The 2030 vision for urban & territorial planning**
- . P44 **Planning and planning frameworks are growing with increasing urbanization**
- . P63 **Future policy pathways for urban & territorial planning**

CHAPTER 1

The future of urban & territorial planning

1.1 The 2030 vision for urban & territorial planning

United Nations Headquarters, New York, September 2030. An Asia-Pacific mayor speaks at the SDG Climax Summit, as Member States report their final results on achieving the Sustainable Development Goals. The mayor's testimony showcases the accomplishments of local governments in achieving the Goals. In 2018, the national Government made environmental conservation a priority for the country's cities. It developed a national single-plan urban development platform registering all ecological assets.

The mayor reported that the shift in policy and technology had helped her city to reinvigorate its urban core with compact development, resulting in a good scorecard on all Goal indicators relevant to the local level. The city's core had safeguarded its heritage areas and regenerated its inner-city regional trading centre, avoiding the demise of its commercial corridors after most retail buying moved online.

The city uses big data, sensors and citizen feedback to ensure that all public spaces are thriving. Artificial intelligence (AI) assists the city's planning institute to enable real time, data-driven decision-making in order to address problems quickly and ensure reliable service provision, from garbage pickup to park maintenance. Excess car parking areas have been turned into green public spaces. Microenterprises and social ventures are zoned to occupy street-level properties, which creates more vibrant pedestrian corridors.

The AI deployment functions as part of a national single-plan data platform, which monitors local planning initiatives in cities while generating planning and urban design solutions. Community groups can access these options in the municipal services app, which includes urban design and participatory budgeting for walkways and public space upgrades. However, in keeping in line with the city's environmental priorities, city managers also make sure to prioritize funding for lower-income areas with severe vulnerability to climate change.



Figure 2
Entry points for localizing urban and territorial planning



Source: UN-Habitat, 2015.

This 2030 vision can be a reality for Asian and Pacific cities if they pursue sustainable development by means of planning frameworks to support transformational change on overriding challenges and ensure progress on the Sustainable Development Goals. However, the region is vast and diverse, so this chapter must consider both universal recommendations and subregional limitations. First, it will bring to the fore those urban and territorial planning frameworks and innovative initiatives which convincingly respond to the major development challenges across the region: natural resource management; climate change; disaster risk reduction; and socioeconomic inequalities. Against such challenges, this chapter also emphasizes planning that can deliver impact at real scale.

The search in this chapter applies the United Nations-endorsed definition of urban and

territorial planning: a decision-making process making use of spatial visions, strategies and plans (UN-Habitat, 2015, p. 2). This process, which varies widely across the region, responds to institutional, regulatory, technical and participatory mechanisms and procedures defined at the national level and executed locally (see figure 2). Urban and territorial planning can cover a jurisdiction as large as a transnational network of cities, a city-region or a cluster of cities. It can also zoom in to a single city, town or neighbourhood. Importantly, this type of planning encompasses all residents and economic activity, including informality and vulnerability, acknowledging that a lot of conventional planning omits or struggles to account for these populations. Innovative planning should address social, cultural, environmental and economic challenges comprehensively.

1.2 Planning and planning frameworks are growing with increasing urbanization

More planning is now done in the region than ever before, with more professional planning capacity, better government institutions to support planning policy and decentralization in many countries propelling more and better local planning. Through technological innovation, planning data and tools have also become more accessible, affordable and efficient. This development benefits more stakeholders, including more levels of government, a larger private sector and most importantly civil society. Monitoring and participation are now easier, but regulatory frameworks have not caught up in many places.

As confirmed in the New Urban Agenda, planning is now acknowledged as an important implementation tool to promote coherent development policies for sustainable urban and territorial development.⁴ Planning strengthens people-centred development and protects ecosystems with such key future resources as fresh water and carbon sequestering trees.⁵

Countries are moving forward with national spatial frameworks, city-region planning and local planning for urban regeneration. First, national territorial planning frameworks are becoming stronger and more ambitious, extending their economic development goals and incorporating a range of sustainability issues. Systems thinking about networks of cities is in vogue and they are becoming greener. Second, city-region planning arrangements are becoming more effective at coordination as they seek to bring effective and resilient benefits from continuing city expansion. Finally, planning for urban regeneration is wide

spread. In Asian and Pacific cities, urban renewal was for too long the heavy-handed and often-feared tool for slum clearance. However, in many cities in the region, the era of a black-and-white differentiation between formal and informal, decent and underserved, liveable and unhealthy is over. Informal, underserved neighbourhoods are the daily reality for many people in the region. However, even in newer, rapidly built urban areas in the so-called formal city, quality-of-life issues abound. Hence, effective regeneration strategies are again sought after.

Success in the region shapes planning in the region

Mainstreaming new approaches to planning is driven not only by the pressure of shared challenges. Successful cities also influence planning elsewhere, and there are increasingly more of them in the region. Peer influence originates from developed economies in the region, through overseas development assistance, sponsored city-to-city collaboration, outward private sector investment and, at a slower pace, through overseas students graduating from planning schools in the countries with leading educational institutions.

Certain Asian and Pacific cities inspire their peers because they are among the world's best planned and managed. The Global Liveability Ranking of 2018 puts Adelaide, Melbourne and Sydney and Osaka and Tokyo in the global top 10, with Melbourne coming in second in the Economist Intelligence Unit Global Liveability

⁴ General Assembly resolution 71/256, paras. 15a, 81, 88 and 92.

⁵ Ibid., paras. 15c(iii), 65 and 72.



Ranking 2018.⁶ Another 2018 index ranks Seoul in the global “social” top 10, and places Hong Kong, China, and Singapore in the overall global top 10 because of their economic performance, although this same ranking does not include any Asia-Pacific entry in its top environmental cities (Arcadis, 2018). Chinese cities other than Hong Kong, China are usually not at the top of sustainability rankings, but Chinese outward investment carries along the image of strong performance.

Japan is now putting emphasis on more capital-intensive innovations in partnership with the private sector, such as urban regeneration for key inner-city transport nodes. Significant examples are Tokyo Station’s now quarter of a century old regeneration (Kido, 2014) and Tokyo’s ongoing Shibuya Station regeneration (Bureau of Urban Development, Tokyo, 2018). The projects overhaul ageing transport structures, add space for inner-city jobs and create trendsetting new public spaces. The private sector ensures the financial viability of these projects, which may take a decade or more to realize, by negotiating selective deregulation and other planning decisions (UN-Habitat and others, 2019). In terms of overseas investment, the private sector often seeks similar opportunities. With most know-how held in the private sector, the transfer modality is more business-to-business than city-to-city.

Australia has peer influence in the region at a lesser scale than East Asian countries, but

it compensates for that through a significant weight in planning education. Australia is offering more planning courses than the United States or the United Kingdom of Great Britain and Northern Ireland with hands-on education; graduates often do detailed planning approvals for state and local governments during their course of study (Sipe and Vella, 2017, p. 357).

What degree of influence students carry with them when they return home is an open question: the latest in the planning of shopping malls and public buildings, an appetite for innovative pilots or an appreciation of the governance context of Australian statutory planning? After graduating, young planners continue learning in planning associations. There is a diverse landscape of national planning associations, with influence being uneven. International and regional planning associations, such as the International Society of City and Regional Planners and the Eastern Regional Organization for Planning and Human Settlements play a role, but membership is not a professional requisite and remains geographically uneven. Planning associations are an important vehicle for continuous professional education, but they focus on compliance and solutions while academic planning research prefers multidisciplinary exploration. Knowledge transfer in the area of planning is not easy.

Planning institutes and education in the Republic of Korea and Singapore are also influential, but their presence is more recent than Australia’s.

⁶ The Economist Intelligence Unit publishes the annual Global Liveability Ranking, which ranks 140 cities for their urban quality of life based on assessments of stability, health care, culture and environment, education and infrastructure. For details, see www.eiu.com/public/topical_report.aspx?campaignid=liveability2018.

"National spatial frameworks and national systems of cities traditionally have an economic policy function associated with spatial economics and industrial policy."

China's planning capacity is catching up very quickly, and its planning institutes are numerous and large; they will soon be a business disruptor for planning in the region. While India is not yet fully exporting planning services, as East Asian countries do, Indian planning professionals and companies will increasingly benefit from the country's open information economy. In the future, aided by artificial intelligence, Indian planners could undertake the upgrading and maintenance of statutory or other planning processes in many countries. They could also support virtual planning consultation processes in the same way that international engineering companies are already doing with current technologies, for instance for municipal utility management. All these cross-border interactions in planning will enhance the peer influence of top cities and of the planning institutes and companies that service these cities.

Scanning spatial planning in the region

National spatial frameworks and national systems of cities traditionally have an economic policy function associated with spatial economics and industrial policy. However, more comprehensive and integrated approaches are emerging in the Asia-Pacific region, as illustrated in figure 3 and evidenced by the sustainable planning frameworks that have preceded the United Nations global sustainable development agreements (UN-Habitat, 2015, p. 10).

Malaysia's national planning framework has become more comprehensive and integrated

in recent years and its National Physical Plan is an important component. Across the board, Malaysia has acquired a reasonable institutional capacity for strategic spatial planning with regulatory controls at the national, state and local levels. The National Physical Plan is an important framework, especially for subregional spatial planning, that supports development of specific corridors and city-regions. Planning procedures and controls interact with many stakeholders, including the strong Malaysian private sector at the subnational and local levels, yet at the same time government institutions have tools to engage in public sector led strategic spatial planning and develop strategically negotiated outcomes (Malaysia, Ministry of Urban Wellbeing, Housing, and Local Government, 2016). This approach results in more public processes of decision-making, which have nurtured urban development institutions and organizations, such as Urbanice Malaysia and ThinkCity, also in Malaysia (ThinkCity, 2017).

Japan's experience in developing and greening economic corridors preceded Malaysia's. Japan introduced successive national comprehensive plans supporting economic growth with a strong industrial policy focus. These plans took advantage of Honshu's linear economic corridor, promoted scale and density in key urban centres away from Tokyo and optimized national connectivity (World Bank, 2017, pp. 3-4). This approach requires infrastructure-led regional and city expansions, public housing and social development investments. It is well documented that Tokyo kept expanding and its economy bubbled and crashed, but also that

Figure 3
Champions of emerging integrated planning systems



Source: UN-Habitat, 2015.

environmental and decentralization pressures, which had steadily grown, won out (UN-Habitat, 2017a). Ageing and the depopulation of rural areas and secondary towns, an increasingly pressing concern for Japan, came to the fore. At the national level, environmental priorities were pivotal to the 2005 National Spatial Planning Act (Japan, Ministry of Land, Infrastructure, Transport and Tourism, 2016, p. 15).

Japan accomplished a national spatial framework, with strong sustainability assurances, that addresses head-on the development challenges when ageing and depopulation set in. Japan is facing the reality that entire rural regions will be depopulated and its population will decrease from the current 127 million people to 88 million by 2065 and about 50 million by 2115 (National Institute of Population and Social Security Research, 2017). Consequently, government policies are focused on urban regeneration: while people age, so does infrastructure. Urban districts need to upgrade amenities and buildings to accommodate an ageing population working and living longer. Meanwhile, central government policies no longer

rely on stimulating local growth through public capital investment, but rather seek private sector support for new innovation districts and zones in second-tier cities, with negotiated regulatory incentives. Fukuoka, in south-west Japan, has such a strategy, pulling in new investment and, for now, a modest population inflow. The municipality and the surrounding prefecture drive the advocacy of the “Fukuoka Next” innovation strategy and its strategic projects to investors and city stakeholders (Takashima, 2015).

The Philippines has done a lot to strengthen local planning while mainstreaming national priorities, including resilience and climate change preparedness. The first National Physical Framework Plan was developed in 1993 with a 30-year planning horizon. As an archipelagic country, connectivity is geographically constrained and spatial development can be long range. National economic development plans have a shorter five-year cycle. However, a new framework was already introduced in 2001, also for 30 years, to better enshrine sustainable development and social equity (Philippines, 2016).



Indonesia's emerging planning framework is aimed at accommodating more strategic investment in the infrastructure of a system of cities while accommodating diverse planning agendas for local sustainable development. Greening cities and ensuring resilience are intermediate objectives needing capital investment to create the conditions for prosperity. The key feature of this framework, enshrined in the National Spatial Plan, is its system of tiered cities and growth poles. This structure supports development planning in the National Urban Policy and Strategy, which treats green and resilient urbanization as a stepping stone (Indonesia Habitat National Team, 2016). By 2025, Indonesian cities should have basic liveability principles; by 2035, they should be environmentally sustainable and resilient in the face of natural and human-made disasters; and by 2045, they should be truly prosperous, technologically smart and economically competitive (Sucahyono, 2019). The National Spatial Plan has been an important foundation for the fast-track strategic infrastructure investment programme rolled out by the Government in 2014. The Ministry of Public Works has been instrumental in delivering planning coordination and implementation support nationally. Indonesian spatial planners now handle a variety of challenging urban development programmes, from the relocation of the national capital to East Kalimantan, to new towns, land reclamation development, transit-oriented development programmes and urban regeneration (IAP, 2018).

Progress on statutory spatial planning in Indonesia has been more difficult. In 2014, the

Government moved the regulatory oversight of spatial planning from the ministry overseeing infrastructure to an enlarged Ministry of Land and Spatial Planning. The ministry was set up by merging respective departments of the Ministry of Public Works, the role of which was spatial planning, into the former National Land Agency, the role of which was administration of land registration. This move was made to improve coordination among decision makers and stakeholders by having a single window for land and planning information. It also separated the statutory land use planning authority from implementation mandates. Oversight and monitoring should have become more neutral and evidence-based rather than implementation driven. For too long, spatial planning was used mainly to provide a sufficient physical rationale for sectoral capital investment, but the coordination between sectoral investments was often not aligned, let alone spatially optimized.

The 2014 changes were an admirable departure from previous approaches. Local authorities are now acknowledged as the owners of their planning processes, but they have insufficient capacity and means to implement plans due to such issues as poverty or city-region coordination. Progress shows that good statutory spatial planning at the local level is mostly an indication of administrative and legislative capacity. Spatial planning does not drive development. In 2017, as the Indonesian Planning Association reported that, of the 1,838 local spatial plans Indonesia needs, 10 per cent had not yet been started, 88 per cent were in development and only 2 per cent had been approved by local councils (IAP, 2018).

"National spatial plans in many countries endeavour to encompass sustainability issues, such as resilience, tourism, culture and rural revitalization, but planning frameworks are incomplete and lack institutional coordination."

The incremental progress of local planning in Indonesia reflects structural problems unresolved to date. In particular, there is a continuing structural disconnect between infrastructure-led strategic planning and comprehensive local planning. By merging land administration and planning functions, a non-executive ministry attained new national regulatory functions but lacks a direct coordination line to local authorities. Many certified Indonesian planners deliver a variety of services outside the slow statutory planning process, for instance as development advisers in support of a myriad of local government, private sector or community programmes. Such work more easily produces innovative results in districts and cities with open-minded and capable local leaders. Local government associations and other capacity-building initiatives also provide constant support to help local developers and stakeholders navigate cycles of vision planning, planning development and action programming. These engagements also open up opportunities to advise on cross-cutting issues in relation to human rights, equal participation, gender issues, circularity, climate adaptation and disaster prevention. There is scope for innovation, yet the safeguards of a robust regulatory urban and territorial planning framework are still missing.

Many planning frameworks are still in the making

National spatial plans in many countries endeavour to encompass sustainability issues, such as resilience, tourism, culture and rural

revitalization, but planning frameworks are incomplete and lack institutional coordination. For example, Bangladesh hopes to draft a national comprehensive development plan for 2050, encompassing close to 500 growth centres, highway corridors, flood vulnerability and regional disparities (Taufique, 2018). According to the author of the report describing that plan, Bangladesh conducts planning on an ad hoc basis, based on political, donor and public demand. Data and technology have become more accessible and affordable, but not necessarily sufficiently timely and disaggregated in order to respond to the statutory planning needs of districts. As a result, strategic and rapid planning approaches are being applied but once more without a proper regulatory framework (Taufique, 2018).

In other countries, important issues are being reflected in current planning, but often only as projects and pilots. Aid agencies have long treated spatial planning as grant assistance, done by overseas consultants in order to prepare for loan-funded capital investment. However, there is a trend towards multilateral loans funding strategic urban and territorial planning with stronger emphasis on institutional strengthening and local capacity-building. This happens in Nepal, which has a tremendous need for integrated urban development planning. Numerous new municipalities were created in the Himalayan country as a result of its 2015 constitutional reform and federalization. It is now planning for two urbanizing corridors with subregional urban centres. Strategies and capital investment planning are being

"Issues of coordination and statutes remain unresolved in several countries, where national spatial plans exist more as visions than as frameworks."

demonstrated in two pilot areas along the corridors (Nepal, Ministry of Urban Development, 2016, p. 108).

Issues of coordination and statutes remain unresolved in several countries, where national spatial plans exist more as visions than as frameworks. Often, the two main reasons are the persistence of technocratic master planning, which plans only what needs to be formally built, and a regulatory inability or unwillingness to allow planning to encompass and potentially regularize informal areas, contested zones or even urbanizing expanses in rural areas. Pakistan's Habitat III National Report lists these issues as the root cause of why plans are made but rarely implemented (Pakistan, Ministry of Climate Change, 2016, pp. 29-32). Sri Lanka produced a National Physical Plan prescribing compact urbanization, yet planning implementation is hampered by institutional fragmentation (Sri Lanka, Ministry of Housing and Construction, 2016, pp. 19-21). The planning framework puts the onus for sustainable spatial development on local authorities while encouraging ad hoc solutions, for instance by means of development concessions with uncertain participation protocols (ESCAP and UN-Habitat, 2015, p. 168). Cambodia started with a draft national urban development strategy in 2015 in order to move from a few urban master plans to more comprehensive urban policies (Cambodia, General Department of Housing, 2016, pp.18-19). The national planning system is still dominated by sectoral agencies involved in corridor planning, for instance through the official development assistance-funded development

for the economic corridor and priority border areas of the Greater Mekong Subregion (Japan, Ministry of Land, Infrastructure, Transport, and Tourism, 2016). Corridor planning at this transnational level exposes future urbanization challenges without necessarily providing more local capacity to deal with them.

Meanwhile, in Central Asia, spatial frameworks are still essentially technocratic and dominated by master plans. For instance, Kazakhstan produced a national 2050 strategy with a territorial plan and maintains master planning standards but has yet to prepare an integrated vertical governance framework (Kazakhstan, Ministry of National Economy, 2016, pp. 12-23). Tajikistan also maintains a master planning approach developed in central agencies (Tajikistan, 2016, pp. 29-48). A recurring issue is that planning strategies still follow the approach used during the era when Kazakhstan was part of the Union of Soviet Socialist Republics, heavily bureaucratic but also unpredictable. The prevailing trend in the region is that each elected mayor develops a new urban development strategy different from his or her predecessor, thereby undermining integration and continuity (UN-Habitat and ESCAP, 2018).

Transforming national planning frameworks for national sustainability

The region's most recent and far-reaching transformation in sustainable national spatial planning frameworks occurred in China. In March 2018, the central Government moved the mandate to regulate the national planning



strategy to a strengthened Ministry of Land Resources, ensuring that a single agency would oversee the utilization of both land resources and natural assets across the entire regulatory spectrum of land use and strategic planning (China Centre for Urban Development, UN-Habitat, 2018). The change is similar to Indonesia's in 2014, but the impact is potentially more far-reaching as China has a strong spatial planning framework.

Reinventing sustainability rationales for Chinese national spatial development and the institutional planning framework is turning out to be extremely challenging. The coordination challenges are significant given China's size, but also because the economics that have driven national spatial development are no longer clear. At a macroeconomic level, China's policy to overcome the socioeconomic disparity between the coastal provinces and inland China continues. New infrastructure, including new connectivity brought by highways, airports and the high-speed rail network, creates new corridors and city cluster networks that can grow along transit nodes. At the microeconomic level, senior economic policymakers have argued for land market reform, for instance by reducing the supply of industrial land in favour of development for mixed-use projects with both commercial and residential areas. They also call for marketing rural land in city cluster areas so as to increase the supply of land for urban development and revenues for rural communities (China Centre for Urban Development, UN-Habitat, 2018). China's disparity has now been reframed. The country is no longer divided between an affluent seaboard

and impoverished inland areas, but between urban prosperity and rural citizens at risk of being left behind.

Low-carbon urban development is a key planning tool in the current Chinese national spatial planning context, but it is no panacea. China developed incremental experience in clean and green urban development, originally derived from the need to remediate heavily polluted urban industrial sites and waterways into usable urban land. Moreover, as air quality dramatically worsened over the past few decades, China has hastened factory closures in urban areas and invested in new energy sources, including renewables. Fiscal revenue for cities to service debts and pay for low-carbon development relies on land value conversion. Regeneration is a slower and more complex process with more stakeholders. Furthermore, low-carbon solutions increasingly include expansive greenways, urban wetlands, urban forests and other green resources which attract higher-end real estate development. Exemplars include Hangzhou's decade-old "Forest City" concept and Chengdu's newer "Park City" concept that both introduced high-quality, low-carbon development expectations, but not necessarily compact urban development (UN-Habitat, 2014, pp. 41-45). Jiangsu Province's innovative multilevel governance approach to provincial spatial planning is a good practice, which reinforces a future pathway for integrated rural-urban sustainability planning.

. BOX 2**Integrated, coordinated, adaptive planning in China's Jiangsu Province**

Not counting China's four principal city administrations, including Beijing and Shanghai, Jiangsu is the country's most prosperous province. Its 80 million residents have a GDP per capita valued at close to \$18,000, representing an increase of more than 40 per cent over the past five years. Jiangsu Province is now almost 70 per cent urban, up from less than 18 per cent urban in 1978. As is the case anywhere else in China, Jiangsu's cities first introduced master plans to plan new city districts and industrial parks. In the past 20 years, the province instituted citywide strategic planning, abolished the role of counties in large cities and added metropolitan planning frameworks. Jiangsu's Urban System Planning 2001-2020 was China's first territorial provincial planning framework.

In Jiangsu, planning decisions are disaggregated to eight sectoral departments. The simplistic idea of returning to a singular master plan is now giving way to the realization that China needs "comprehensive blueprints". Moreover, the real difficulty is organizing the functions of spatial decision-making, planning delivery, monitoring and regulatory oversight. Internalizing all functions will not necessarily lead to more coordination and could easily defeat the need for more participation between stakeholders – a vital requirement in a context of significantly increased complexity in regeneration and peri-urban areas. Leading planning experts in China advocate the shift to blueprint planning processes with defined goals and clearly laid out options for intervention. The "blueprint" concept is designed to supplant "visions", which have always been tied to linear, top-down decision-making in China. On the contrary, the notion of blueprint points to a working drawing, a layout that needs to be actualized, adapted and complemented by action plans and many forms of collaboration strategies – city and region, government and community, public and private. Provincial and urban regional blueprints should be holistic and sustainable but allow diversity, change and participation where needed.

Source: National Bureau of Statistics China, 2018; -Nan and Wang, 2019; and Chen, Y., 2019.

Urban expansion and negotiating informality

With or without improved national frameworks, Asian and Pacific cities beyond China are still expanding. Metropolitan development remains strong and city-region planning is increasingly important. Since 2006, Malaysia has established five subnational economic corridors and regional development areas, each supported by regional development authorities. The approach enables differentiated integrated solutions for the environmental and ecological context of each subregion, for medium-term planning for infrastructure and for more equitable

services development for both cities and rural communities (Mentek, 2019). In the last five years, Indonesia has set up 35 strategic development regions across the country as part of its strong territorial development strategy. The previous development strategy had more simplistic infrastructure principles, mainly focused on national logistics, not the least in support of a natural resources economy. The new programme has the features of a genuine industrial policy, with a focus on subnational productivity and competitiveness in order to reduce national disparities. In the regional development areas, integrated planning and investment planning can be more devolved and adjusted to local

"Industrial policy that makes intelligent use of urban and territorial planning still requires improved planning legislation and governance with regard to data sharing and transparency, city-region governance solutions and independent implementation monitoring."

needs. At the same time, the programme is aimed at delivering economies of scale and encouraging agglomeration benefits. Thematic priority programmes can be nationally supported across a number of subregions, providing more potential planning synergies and making better use of limited specialized planning know-

how (Suchayono, 2019). However, industrial policy that makes intelligent use of urban and territorial planning still requires improved planning legislation and governance with regard to data sharing and transparency, city-region governance solutions and independent implementation monitoring.





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Subnational corridor planning that encourages economic development away from national centres is also becoming a key instrument for national sustainable development in least developed countries. They are moving on from the simplistic approaches of stand-alone bonded zones and industrial parks. Corridor planning complements the economic solutions of bonded zones, special economic zones, specialized and incentive-loaded industrial parks and other

tools in the realm of special-purpose vehicles for territorial development planning. Integrated territorial planning was often missing and free-riding agglomeration effects would ensue. Less advanced factories outside the special zones were more polluting and labour conditions more exploitative. The newest corridor planning in Nepal, as mentioned previously, is conceptually about two continuous, parallel economic corridors, one in the Terai lowlands and one more central, traversing Kathmandu. They are conceptualized as integrated development plans for three or four municipal authorities, and planning development comprises strategies on electrification, connectivity, agribusiness, industrial and logistics development and the development of shared municipal basic services (Nepal, Ministry of Urban Development, 2019). Common planning methodologies include capital investment planning. Solutions can cater to local challenges and priorities with regard to customary land or tourism potentials, and ideally a regulatory framework should be developed to ensure both devolved initiatives in response to challenges and national-level safeguards.

Transit-oriented development (TOD) solutions, which situate high-density housing and commercial land near public transport nodes, are another approach to negotiate sustainable urban expansion into adjacent regions. The method is catching on, especially in many middle-income countries in the region. Urban expansion has led to car or motorcycle-saturated cities in many Asian countries. By contrast, TOD solutions were crucial in the development of contemporary Japanese city agglomerations and such cities

"New and satellite town development will remain an important component of city-region expansion strategies in Asia."

as Mumbai in India (Adusumilli, 2016). TOD makes use of new rapid bus and rail networks, thereby reducing spatial development sprawling outward along highways. Multinodal approaches distribute housing expansion, and land-value capture can accommodate peri-urban settlement upgrading. Improved and subsidized public transport can also increase labour mobility.

In Indore, India, TOD is a crucial instrument to plan for job access and housing affordability for the expanding ICT sector (India, Ministry of Housing and Urban Poverty Alleviation, 2016, p. 51). The approach requires a strong vision and regulatory support with regard to density; mixed-use, walkability, park-and-ride requirements; and public-private joint development (Kidokoro, 2019). In general, planning restrictions easily send signals to the market concerning land supply restrictions. Hence, the approach works only if sufficiently ambitious in scale and scope as well as being supported by governance that stretches beyond short-term electoral cycles. Kuala Lumpur's application of transit planning zones, with standards both for population and jobs density, is a good example. These zones need to be complemented with mixed-use regulations, incentives and walkability standards (Hashim, 2019).

New and satellite town development will remain an important component of city-region expansion strategies in Asia. As mentioned previously, Indonesia announced its intention in August 2019 to begin planning for a new capital city in East Kalimantan on the thinly populated island of Borneo in order to relocate

from drowning Jakarta, a city with an outsized historical influence on the country's politics and culture. The Capital Development Authority of Dhaka has begun planning for Purbachal, a new town for 1 million residents, with a range of social and environmental safeguards (Bangladesh, Urban Development Directorate, 2019). New town development has always been a contested aspect of urban and territorial planning. Traditionally, State authorities have been responsible for making available free and clear land. New town development spearheaded by the private sector usually leads to community land conflicts or to a handful of landowners who hold out and refuse to sell. These scenarios do not realize the intended economies of scale while potentially stressing the banking system. The region has not yet forgotten the 1997 Asian financial crisis. Innovative approaches to make land pooling less risky, in a context of weak State institutions in many Asian countries, are still being sought.

National planning frameworks in Asia and the Pacific must continue to accommodate land tenure informality and complexity, a task which requires national legislative safeguards and subnational planning approaches. The overriding concerns of policymakers in Pacific countries are informal settlements and customary landownership (UN-Habitat and others, 2019). Comprehensive planning cannot be integrated without ensuring free, prior, informed consent and fair compensation while building sustainable relationships and partnerships with customary landowners. In most countries, the building of land administration systems has not kept pace



with the building of cities. Local planning needs to accommodate the concept of the continuum of land rights, reflecting documented and undocumented tenure, formal as well as informal, for individuals as well as groups, legal or not legal, men and women (GLTN, 2016).

There is ample scope for solutions and innovations in the region. Indonesia's property tax certificates were long understood as a halfway recognition of tenure rights.⁷ India's slum upgrading has been making use of the instrument of notification, which recognizes slum areas for upgrading programmes without according formal tenure (Raines, Krishna, and Wibbles, 2018). Kabul introduced more than a million land-use certificates to citizens in informal neighbourhoods through community-based land surveys. The certificates are the basis for the start of ward-level property tax levies. Authorities ensure community collaboration by providing grants for community-based small-scale infrastructure upgrading schemes. Data technology and data-sharing applications are also making area-based land pooling initiatives easier to manage transparently. (UN-Habitat, and others, 2018). In Kampong Bharu, a traditional neighbourhood of Kuala Lumpur, transferable

development rights endowed to residents have set in motion a complex redevelopment programme in which residents will retain a share in its future value (Hashim, 2019).

In many Asian and Pacific countries, incremental upgrading of informal settlements has been successful, although often without applying citywide strategies that would ensure the fully equitable outcomes and benefits of working at scale. Many interventions regularized neighbourhoods by providing essential basic services, stabilizing erstwhile slum neighbourhoods and putting them on a path towards incremental improvement. Several community development initiatives have flourished in Asia and the Pacific over the past 30 years, occupying the political-economic space of collaborative incremental upgrading, which reduced forced evictions, increased health and well-being and maintained a casual labour force within cities and in city peripheries. If improvements are too generous, then gentrification sets in; if too meagre, then low-quality neighbourhoods with low-quality amenities persist, waiting to be bought out and taken down by real estate interests.

⁷ Bruno Dercon, Senior Human Settlements Officer, UN-Habitat Regional Office for Asia and the Pacific, email to author, 10 September 2019.



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"Urban policies are needed to define and support informal settlements as valuable assets in developing cities that contribute to social and economic diversity and resilience."

Accommodating informality in future planning strategies

Urban policies are needed to define and support informal settlements as valuable assets in developing cities that contribute to social and economic diversity and resilience. Long-term planning strategies should be aimed at retaining many informal and often very liveable neighbourhoods in cities, rather than reducing them to heritage curiosities of a forgone time. In Indonesia, Solo and Surabaya are two cities where successful leaders were able to forge such strategies. In Solo, President Joko Widodo introduced a strategy of incremental improvements of neighbourhood markets across the city in 2008, followed by steadily stepping up the regeneration of main streets and the central market. In Surabaya, the city introduced a 10-year strategy of greening slum neighbourhoods, consolidating a 30-year compact between city leaders in order to maintain a low-income workforce within the city rather than to rely on low-income casual workers from rural villages or small towns from outside the city. As part of these challenges, the city government holds to a remarkable strategy of not making city-region transport too efficient, for instance by

holding off on highway schemes or by refusing to increase significantly minivan transport through the city-region. Surabaya's priority is to increase public transport and walkability within the city (Silas, 2014; 2016). However, strategies such as these that selectively reduce capital investment are easily contested in the political arena. Furthermore, integrated planning often requires trade-offs, which are not easily communicated between different professional communities. Integrated planning needs national and subnational institutions ensuring transparency, public dialogue and, above all, strong territorial development frameworks. Planning should always stimulate intersectoral dialogue solutions. Collectively supported strategies can bring more benefits than simply seeking formal land titles in all informal settlements. Surabaya City is a positive example of how the process of engaging communities in city governance can form a pathway for other cities to implement inclusive and green territorial development planning.



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. BOX 3

Championing green community development in Surabaya

Surabaya is the second largest city in Indonesia with a population of more than 3.5 million inhabitants. The city is an important economic centre for Indonesia, anchoring a metropolitan area of about 13 million people. This large industrial conurbation produces for the consumption markets of Java and across Indonesia. As the capital of East Java Province and as a port city supporting trade and services, Surabaya has rapidly developed, and its urban landscape is nowadays characterized by new medium-rise office blocks as well as modern markets and hotels along green boulevards that coexist with early 20th century heritage buildings. The kampongs – low-income, popular neighbourhoods of traditional low-rise buildings – are particularly important to preserve the indigenous sociocultural values of the city, as they are home to 60 per cent of the city’s population. Successive land use plan revisions have oscillated between a modern city vision or reverting to unplanned urbanization where mangroves face extinction, rivers remain heavily polluted and indigenous kampongs remain poor.

Surabaya established its flagship Green Kampong programme in 2014. The programme has become an innovative citywide planning and development strategy that combines tools, such as decentralizing planning decisions, while encouraging local democracy, participatory planning and budgeting, and environmental management. At the city level, Surabaya manages the “Citizen Park Space Programme”, which works with slum communities to relocate them from degrading riverbanks and transform the areas into popular community parks, each sponsored by private companies. At the neighbourhood level, Surabaya has encouraged communities to adopt a zero-subsidy kampong greening approach, instead generating revenue through their own small-scale entrepreneurship. Local companies and media are sought to promote competitions, award innovation and encourage best practices at the local level. National poverty reduction programmes are recorded through a collaborative e-governance mapping platform, enabling easy identification of gaps in service provision.

Through these strategic territorial planning policies, a more compact and environmentally friendly city has emerged with green neighbourhoods at the centre of urban development. The Green Kampong programme has delivered a community-based solid waste management system, leading to revenue generation, employment and a decrease in disease among more than 100,000 participating households. The e-governance platform for map-based community budgeting has strengthened social cohesion and participation and enabled a more equitable distribution of resources. Local media and key private sector players have been mobilized in support of community-driven initiatives for green and safe public spaces. The increasingly active and informed citizenry have influenced decision-making in favour of the long-term vision of sustainable urbanization for Surabaya and the region.

Source: UN-Habitat, 2015, p. 24.

"Asian cities are seeing a host of creative initiatives in the upgrading of public spaces in and around informal and heritage neighbourhoods in cities."

Compact urban development, regeneration and public space strategies

The planning community in Asia and the Pacific is quickly awakening to the fact that urban regeneration is one of its main challenges. After accommodating rapid development in the post-war era, Asia-Pacific countries are now framing an agenda to reinvest in cities, with a focus on quality in addition to quantity. There are multiple drivers: economic land use has changed quickly with the deindustrialization of cities and the introduction of environmental regulations; earlier rapid urban development was of low quality; needs and tastes are changing quickly alongside demographic and income-level changes; real estate businesses seek new opportunities for land value capture, for instance with the introduction of new public transport; the economic realization that mixed-use spatial patterns combined with affordable housing brings more job mobility and hence benefits the services and creative sectors; and the environmental and health benefits of mixed-use and walkable communities. Hence, there is a change in demand and supply, realities and expectations. Nonetheless, complex urban contexts require more complex regeneration processes with more collaboration than demolish-and-rebuild renewal. When done well, they create considerable value out of existing assets. The prospect of regeneration captivates planners and other stakeholders and can create a lot of sustainability benefits. It also invites collaboration and action planning for concrete areas and tangible people-centred

accomplishments, which is one more way to reduce the technocratic stigma of modern planning.

Planning for regeneration and place-making more easily introduces governance renewal without requiring broad national legislative and regulatory changes. Malaysia is introducing business-improving district schemes, which allow area stakeholders to set up a special-purpose vehicle for area-based upgrading. This localized approach can tailor funding to solutions rather than relying on upgrading as the sum of initiatives of private investors and city interventions in streets and public spaces (Hashim, 2019). Asian cities are seeing a host of creative initiatives in the upgrading of public spaces in and around informal and heritage neighbourhoods in cities. Where initiatives are successful, they usually create pride and can easily be replicated. The place-making movement in Asia is alive and increasingly connected. It thrives on such initiatives as upgrading community markets, building better public spaces for children, introducing safer streets for women and creating barrier-free access for the elderly and disabled. Public space programmes create thriving urban places. Place-led development can support improved quality of life, upgrade the environment, build strong local economies, preserve cultural traditions, inspire creativity and achieve social equity for all residents and visitors (Wuhan Planning and Design Institute and others, 2018).

In going forward, regeneration needs to be captured in regulatory planning frameworks, which provide template solutions for investment,



ensure rights and responsibilities for stakeholders and encourage cities to apply equitable citywide approaches. As previously discussed, regeneration is not about deregulation, even though that may be a necessary component. The Government of the Republic of Korea has started an ambitious urban regeneration programme in the face of dissatisfaction with the liveability of recently built neighbourhoods and an ageing population. The programme mobilizes youth and seeks to increase the economic attractiveness of city neighbourhoods to support a more diverse economy with a greener footprint.⁸ Malaysia invests in citywide heritage programmes, with components of social mobilization, public space innovation and revival of traditional markets (ThinkCity, 2017). Similar initiatives are taking place across the region, unleashing a wave of creativity and optimism for more liveable cities and decades of opportunity for grass-roots planners, urban leaders and creative businesses.

The capacity for innovation should never be underestimated in Asia and the Pacific. A recurring governance hurdle in several countries in the region is that the governance for formal and informal settlements remains separated. For instance, the Islamic Republic of Iran has a solid legacy on urban development, yet it has maintained the dual structure of the New Towns Development Corporation and the separate Urban Development and Renovation Corporation. The latter is responsible for catalytic projects in older areas, regeneration in declining city areas, informal settlements and related issues

of urban governance (Islamic Republic of Iran, Ministry of Roads and Urban Development, 2016). An important condition for urban and peri-urban regeneration to flourish is to abolish or reform institutional structures that treat informality separately from integrated and comprehensive planning structures. Regeneration is a citywide and city-region agenda.

Feeding the city and the rural-urban continuum

Cities would not exist without their rural hinterlands. Residents and the planning community alike are discovering new opportunities for the urban-rural integration of Asia-Pacific city-regions that connect nature-based solutions, eco-based services and food production.

With Asia-Pacific's expanding populations, the major focus of urban and territorial planning is on urban development, but there are strong examples where planners conceived of resilient, sustainable urban-rural connections, even though they took time to materialize. Reshaping nature often takes more time than building cities. In 2001, a cross-boundary planning initiative was set up conceptually encompassing the Iskandar development region, its metro development and Indonesia's Riau Islands' uncertain border area development strategy. What materialized was a nature-based, eco-based services strategy for Indonesia's Bintan Island, tapping its short-visit tourism potential.

⁸ For further information on the overall regeneration programme, see www.unhabitatyouth.kr/sdgcscamp2019.

"Planning to restore biodiversity is critical for Asia and the Pacific, both on land and in its oceans and seas."

As a result, local authorities developed a planning dialogue and set aside forest land as a reserve (Vegara, Dwyer, and Kawaguchi, 2012). Planning to restore biodiversity is critical for Asia and the Pacific, both on land and in its oceans and seas (ESCAP, 2019b). This will be an undertaking of several generations.

In the medium-term, planning can help to reverse the ecological cost of suburbanization and sprawl. It can encourage and incentivize productive greening with hobby gardens, small-scale agriculture and community forestry. Planning strategies can anticipate rural depopulation as a result of ageing and prepare for enhanced biodiversity as well as large-scale solar and wind energy production away from urban centres.

There is also an increasing recognition that urban agriculture brings genuine sustainability benefits, although technologies for urban food production at scale are still in their infancy. Fortunately, Asia and the Pacific already has urban agriculture, often abundantly, as an ingrained component of local cultural practices. In the majority of cities and small towns in developing countries in Asia and the Pacific, urban agriculture never disappeared. Even in Japan it remained part and parcel of the urban fabric. Tokyo could produce more than 15 per cent of its annualized food requirements, up from 4 per cent now. Tokyo's hobby gardens and community forests are also essential evacuation sites in case of a major earthquake (Sion, 2017). Urban agriculture is an optimum investment for net-zero carbon emissions from cities and regions. It should

be strongly included in urban and territorial planning, from national planning frameworks to subnational and city-region strategies to urban regeneration plans. Solutions for the rural-urban continuum should become the newest chapter of innovation in Asia and the Pacific.

From urban and territorial planning to urban resilience

Urban and territorial planning is also increasingly important for reducing vulnerability to natural disasters and building resilience to shocks and stresses. Because of sea level rise and land subsidence, adaptation planning strategies for many large delta cities in the region require expansion planning towards safer areas, in addition to adaptation action in inner cities and along waterways, such as in Ho Chi Minh City's 2013 Climate Change Adaptation Strategy. Many adaptation features are about local as well as technical solutions, from tidal barriers to pavement permeability improvements (Vietnam Climate Adaptation Partnership, 2013). Ho Chi Minh City's experience highlights how planning for water can accommodate high-quality urban development and design, but can result in gentrification if not distributed equitably to all high-risk parts of the city. For this reason, comprehensive planning at a city-region scale is important. Furthermore, contemporary dyke management in estuary or river basin contexts requires city-region planning approaches, accommodating both new development and passive flooding areas (Smolders, 2019).



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ESCAP supports the trend of “blue urbanism”, which is a new field of planning particularly relevant to Pacific island countries that focuses on cities’ relationship to the ocean (ESCAP, 2019b). For example, the draft national urban policy of the Solomon Islands mainstreams climate change issues into the country’s decision-making for spatial planning, capital investment for infrastructure development, and environmental and ecosystems management. This perspective is crucial for informal settlements in the country’s urban and peri-urban areas, which are home to 40 per cent of the country’s urban population. Integrating these considerations into Honiara’s local vulnerability assessments has supported a pathway described below that has helped to future-proof the city against climate risk.⁹

The main body of this chapter has navigated planning developments in a region which is large, complex and dynamic. Urban and territorial planning has become more comprehensively aspirational at the macro level, and countries are incorporating strong environmental and resilience dimensions. Planning in the region is also focused on results, seeking more benefits at the subnational and micro level. Regeneration improves the use of existing assets and promises well-being benefits. The region must evolve better planning governance and monitoring as well as the means for planning to support expanded and State-driven capital investment. Frameworks and solutions are worked out iteratively, and regions, cities, local leaders and planners are experimenting in many ways. In the face of such a wide range of choices, that begs the question concerning which bold choices should be the focus of attention.

⁹ For details, see www.fukuoka.unhabitat.org/projects/asian_subregion/pdf/solomon%20islands_final.pdf.

. BOX 4**Vulnerability to climate change in Honiara**

Land tenure is a sensitive matter in Honiara. Within city boundaries, land is held mostly under formal land-lease title, while land beyond such boundaries is held according to customary laws. Even the city boundaries are contested on customary land claims and settling requires informal agreements with the customary communities. Temporary occupation licenses, once conceived as a stop-gap measure, are another form of tenure in Honiara's continuum of land tenure rights. In addition, many informal settlements created on reclaimed land are exposed to the risks posed by cyclones and flash floods. The Government is mapping and planning infrastructure as settlement expansion continues.

Planning for resilience requires citywide hazard mapping and mainstreaming this information into land administration. It also requires participatory and inclusive land readjustment data, creating transparency about who requires relocation and where upgrading can be done, irrespective of title. Dispute-free evacuation sites in case of emergencies need to be pre-identified. Relocation policies and strategies also need intensive community engagement and stakeholder consultations.

Sources: UN-Habitat, RMIT, and Global Land Tool Network, 2019, pp. 28-33.

1.3 Future policy pathways for urban & territorial planning

There are certain future policy pathways in urban and territorial planning that apply to a broad swath of the region's cities. They involve regulatory frameworks, national planning and technology. These recommendations come at a time when macro-level urban and territorial planning has become more comprehensive and aspirational, while countries are incorporating strong environmental and resilience dimensions into their long-term visions. Planning in the region is also focused on results in order to deliver more

micro-level economic benefits; to renew support for expanded State-driven capital investment; and to work out frameworks and solutions on the go. In turn, urban regeneration improves the use of existing assets and promises long-term benefits to communities. Overall, local leaders and planners in the region are experimenting in many ways. All of these aspects combine to create a ripe environment for bold action to enhance urban and territorial planning in Asian and Pacific cities.



The future of urban & territorial planning

Before setting out concluding pathways for the future, it is worthwhile to again underscore guiding principles. For the practical-minded planner, one can uphold a simple set of aspirations for effective planning in support of the Sustainable Development Goals. Urban planning can focus on Goal 11 and the New Urban Agenda, but integrated and comprehensive urban and territorial planning should mainstream all the Goals, climate targets and disaster reduction commitments. Planning needs to be rights-minded, ensuring equitable benefits from urban development and the realization of the right to housing. It should always be mindful of vulnerability. Meanwhile, planning should be about implementation, as well as investment in and retrofitting of infrastructure. Overregulated planning never helps the poor or makes housing more affordable. Rather, planning should be devolved, diversity-minded, simple, rapid and able to generate results. Finally, the planning process should be mindful of national and local contexts and encourage comprehensive participation and participatory budgeting so as to remain politically legitimate. It should encourage collaboration over specialization, but also remind stakeholders of long-term focus (UN-Habitat, Republic of South Africa, and the South African Local Government Association, 2018, p. 11).

In the light of those guidelines, this report recommends three overarching policy pathways:

Integrate sustainability and quality-of-life targets into urban planning to future-proof public and private investment in cities

Co-produce with citizens urban planning solutions that align technological investment with adequate local government capacities

Identify specific urban regeneration and growth strategies that optimize urban-rural and city-region collaborations that spur sustainability and investment



The future of urban resilience



The future of smart & inclusive cities



The future of urban finance

. 1

Integrate sustainability and quality-of-life targets into urban planning to future-proof public and private investment in cities

Planning for economic growth alone is not a 21st century approach. Instead, countries should integrate sustainability issues into regulatory frameworks and urban policies. Environmental and resilience issues need to be strengthened, translated into territorial goals and measured in order to steer subnational development. The same is evident for social development goals, such as poverty reduction and vulnerability reduction. Urban quality-of-life targets need to reflect forward-looking policies with regard to dynamic urban economies, which covers such issues as access to jobs and amenities, mixed-use neighbourhoods and safety for women and girls.

Moreover, regulatory roles in the context of sustainable development are about setting and maintaining goals, targets and indicators for comprehensive development. These should include a new generation of spatial targets and indicators in order to ensure that planning stakeholders in the public and private sector can be held accountable. National urban policies can support the development of the Sustainable Development Goals, targets and monitoring capacity. Efforts to develop coherent urban policies across adjacent countries should help economic connectivity policies. Subregional urbanization policies are important, taking on board essential long-term drivers of prosperity and sustainability, including demographic changes.

Finally, finance institutions should continue to update planning reviews in the light of the current and future challenges of urban development. Regulatory frameworks should encourage participatory consultations and territorial reviews of investments supported by banks and finance institutions. If planning is becoming more accessible and more affordable, banks and investment authorities should make better use of it.

. 2

Co-produce with citizens urban planning solutions that align technological investment with adequate local government capacities

Technology has already been making planning more accessible and affordable. Territorial assessment technologies should be applied and developed, especially with regard to city expansion and urban-rural interdependencies. Developing single-plan transparency should be focused at this level, where economic growth is most complex but also carries the most potential. The massive use of social media across the region encourages dissemination of broadly popular results, which benefits the replication of tangible initiatives, including small-scale upgrading and regeneration. Social media is also increasingly used to alert local authorities of mishaps. Future technology changes and artificial intelligence for planning, however, should not see local planning capacity again be replaced by even more remote private sector planning. Local planning is an essential local public activity that can make use of new and more intelligent tools than remote teams can bring.



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. 3

Identify specific urban regeneration and growth strategies that optimize urban-rural and city-region collaborations that spur sustainability and investment

While planning creativity bubbles up from the local level, it is vital for national Governments and institutions to set criteria for local governments and make citywide planning frameworks and regeneration strategies a mandatory condition for implementation. Most consultations and implementation processes involving planning are made locally, and integration is too easily lost. There is a need for planning know-how about inclusive, equitable, citywide approaches, as planners in the public realm have by and large been trained on the basis of increasingly outdated paradigms of formal versus informal, which hampers practical planning for regeneration. Furthermore, national urban policies need to address increasingly antiquated planning concepts hampering equitable and effective implementation by taking on obsolete principles enshrined in law and practice formulated at very different times less relevant to the urban contexts found today and in the future.

National government regulators and planning associations also have to start considering the impact of smarter planning. The delivery of remote planning services and other business and technology environment changes can bring cost and quality benefits for local governments and

local stakeholders. By strengthening planning at the local level in most countries, heavily centralized, top-down government planning has been significantly diminished. Historically, international private sector planning has been tied to overseas development assistance or overseas investment, with planners having been trained at best to promote better urban quality but deliver privatized liveability.

While not always part of Governments, planning associations should be involved in stronger regional collaboration. They should not simply promote leading cities or countries, but rather focus on streamlining planning goals, targets and indicators and mainstreaming collective risk and development issues. Planning associations should also collaborate to develop common standards, tools, technologies, standards of accountability, anti-corruption protocols and ethics training. Subregional markets of planners could be promoted by subregional certification.

National planning frameworks in the region have accommodated sustainability principles in national visions. More and more, national frameworks absorb ecological and climate change goals. National spatial frameworks apply the concepts of systems of cities beyond simple economic interdependencies. They increasingly emphasize urban-rural and city-region collaboration, which is critical for sustainability, growth and investment.

Conclusion

Urban and territorial planning is the basic building block for creating better urban places. Cities that were guided by plans in the past can point to better outcomes in the present. They provide adequate housing, efficient transport and plentiful jobs aligned with the expectations of a growing or shrinking population. Ideally, these plans do not stop at the city limits but consider the entire metropolitan area across local jurisdictions and even extend into rural areas, accounting for the full economic geography of a city-region.

However, even for cities that grew chaotically or otherwise have not benefited from thoughtful planning, it is never too late to start. Planners must be flexible and deal with current circumstances, as only in the case of new towns are planners starting from a blank slate. Whatever the current state of a city, its future will be better assured if guided by a plan. Ultimately, planning is a lynchpin in establishing a baseline ahead of an uncertain future of global shocks and stresses, ranging from climate change to natural disasters and automation.

Without adequate planning, there can be no resilience, which is the subject of the next chapter.





CHAPTER 2



The future of urban resilience

- . P70 **The 2030 vision for resilient cities**
- . P81 **Taking stock of the region's resilience-building paradigms**
- . P90 **Future policy pathways for urban resilience**

CHAPTER 2

The future of urban resilience

2.1 The 2030 vision for resilient cities

In 2030, the mayor of a medium-sized Asia-Pacific city receives a phone call from the chief executive officer of a multinational corporation. The CEO regrets to inform the mayor that, due to changing market conditions and international tariffs, her company will be closing a manufacturing facility in the city, resulting in the loss of thousands of well-paying jobs. While the city has bent over backwards to accommodate the multinational manufacturer with an excellent location near public transport, these macroeconomic and political forces are simply beyond the city's control. A decade earlier, the mayor might have panicked, as the manufacturer had injected much needed employment opportunities and played a part in growing the city into an emerging technology hub and had become the city's leading employer in the process. However, once the company had settled, the city worked with business leaders and community groups to offer entrepreneurship classes, and it provided incentives for small businesses that could draw on the growing base of workers with high-tech manufacturing skills. Over time, the number of people working for small businesses spun out of the manufacturer's arrival came to exceed the number working at the factory. While the company's closure will be a blow to the city's economy, the mayor takes the news in stride and begins brainstorming on how the factory could be subdivided into smaller specialized manufacturing facilities for multiple small enterprises.

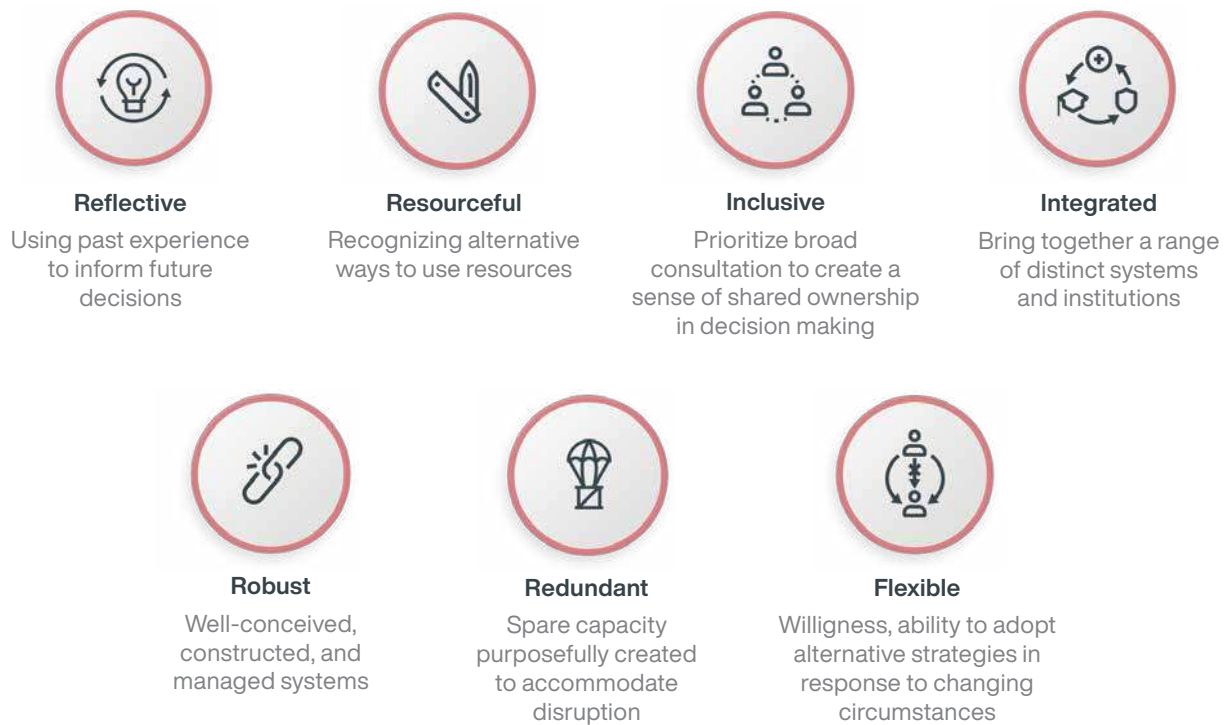
The above scenario is a possible future outcome for Asian and Pacific cities that contrasts with the stories of natural disasters striking the region with alarming regularity and catching cities unprepared. For example, in June 2019 the otherwise monsoon-stricken southern Indian city of Chennai faced a “day zero” water crisis as its

largest reservoir, Chembarambakkam Lake, went bone dry in the middle of what should have been the rainy season. In July, trains carrying millions of litres of water had to come to Chennai's rescue (Gupta, 2019).



Figure 4

Major resilience characteristics that should be built in as part of an urban resilience solution



Source: 100 Resilient Cities, 2019a.

Just months earlier in December 2018, Palu, Indonesia, suffered a triple threat of natural disasters: a 7.5-magnitude earthquake followed by a volcanic collapse, which triggered a deadly tsunami (Wei-Haas, 2018). Two years before that in February 2016, Tropical Cyclone Winston affected 350,000 people in majority urban Fiji and left 32,000 houses destroyed (ReliefWeb, 2016a).

These examples illustrate the need and the potential for cities in the Asia-Pacific region to build resilience in the face of natural disasters, social upheaval and economic downturns. There is no single, universally accepted definition of urban resilience, but in this chapter a broad-based definition is used: “the capacity for urban systems and settlements to absorb, utilise or even benefit from perturbations, shocks and stresses” (Meerow, Newell, and Stults, 2016). Stresses are characterized as slow onset, such as

drought, sea level rise, land-use changes, youth unemployment, and shocks are abrupt, such as flooding, power cuts, food shortages, economic crises and disruptions. As demonstrated in figure 4, a resilient city exhibits certain features: it is reflective, resourceful, inclusive, integrated, robust, redundant and flexible.

Resilience has become an essential tool in urban governance. It comprises a set of strategies that improve policy efficacy, infrastructure implementation, project design, programme delivery and urban planning across multiple levels of decision-making and community action. Good resilience practices inherently bring together diverse stakeholders, such as government institutions, communities and businesses, as well as operate at various levels from the local to the regional.

"Building resilience is a crucial counterbalance that enables localized robustness, flexibility and fail-safe mechanisms that can help cities to thrive and even benefit from global trends."

Resilience efforts achieve maximum impact when pursued through combined approaches that deal directly with interdependent problems. For example, to prevent urban outbreaks of dengue fever, cities can reduce standing water through better urban design, raise alert levels with a text-message-based early warning system and educate young people in schools to take necessary prevention steps at home. Resilient approaches see cities as places where complex threats can be met with systemic solutions, where the agents of change are varied and dependent at times on unusual alliances of those who govern and those who are usually governed.

In this chapter, the primary shocks and stressors affecting cities today and into the future are examined, stock is taken of the multiple efforts that have been put in place to build resilience, and forward-looking pathways are proposed for the region's cities to strengthen resilience in the future.

Current and emerging stresses and shocks affecting urban governance

Building resilience is a crucial counterbalance that enables localized robustness, flexibility and fail-safe mechanisms that can help cities to thrive and even benefit from global trends. In this chapter, a look is taken at the major challenges to which innovative and dynamic multilevel governance frameworks must respond in order to build urban resilience.

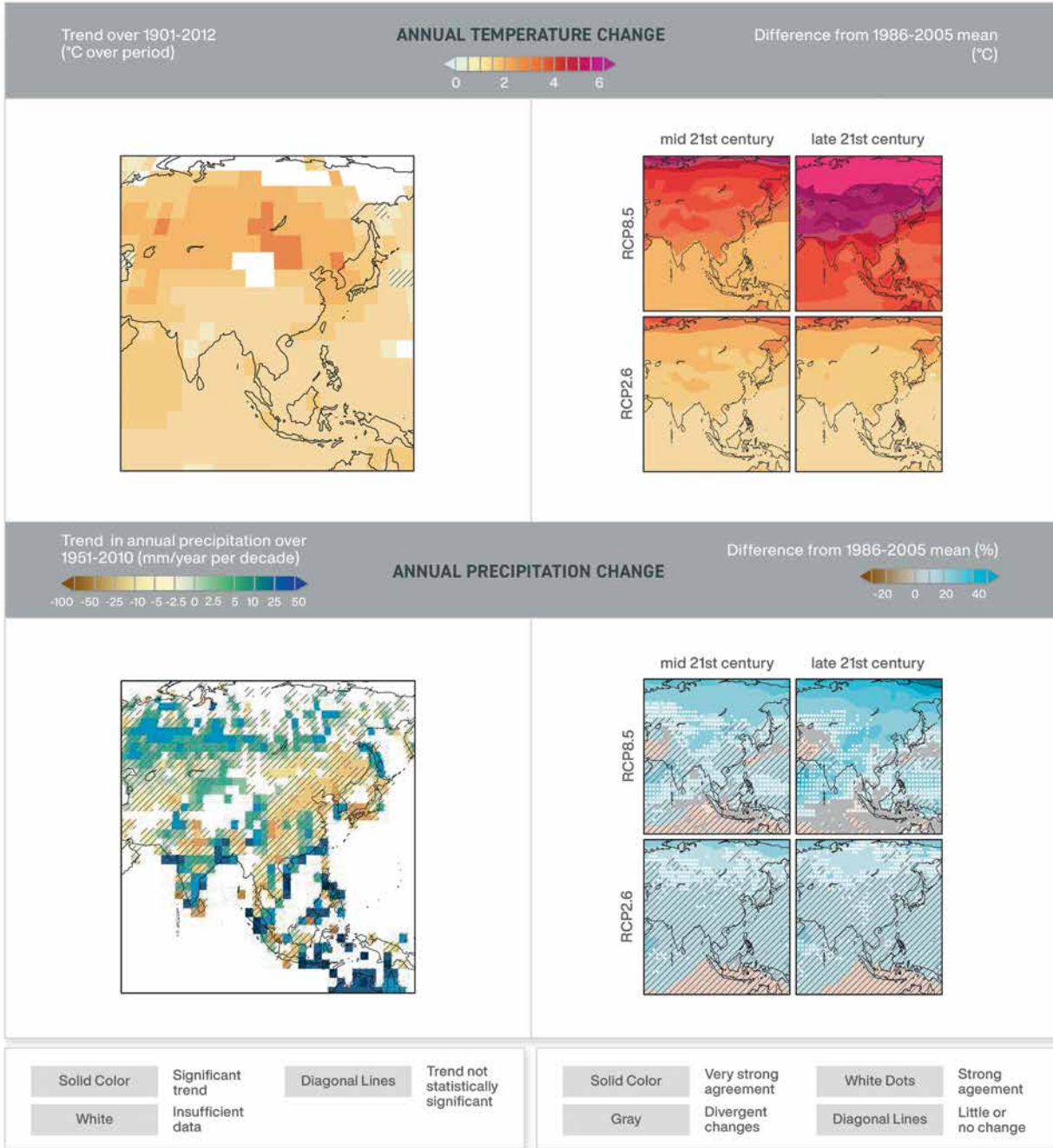
Urbanization and climate change intersect to create and exacerbate other shocks and stresses

Climate modelling and economic forecasting suggest that more catastrophic events are on their way. Under current projections by the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (2019),¹⁰ catastrophic ecosystem loss will disrupt food supplies; increasing heat and floods will force mass migration to cities (Abel and others, 2019); and widespread drought will disrupt and stress human habitats (World Bank, 2018b). Current trends suggest further global warming will increase the likelihood of severe, pervasive and irreversible impacts on humankind, according to the Intergovernmental Panel on Climate Change (IPCC, 2014a). The impacts of climate change are already being felt in the region's cities and are projected to get significantly worse. The Fifth Assessment Report of the IPCC shows that current trends of greenhouse gas emissions will result in further warming and long-lasting changes in climate systems, increasing the likelihood of severe, pervasive and irreversible impacts on people and ecosystems, putting the achievement of all the Sustainable Development Goals into question (IPCC, 2014a).

Heatwave frequency has increased since the middle of the 20th century in large parts of Asia, and warming is very likely to continue into the 21st century (Hijioka, Lin, and Pereira, 2014). Under a business-as-usual scenario, mean summer temperatures could increase to 6°C above pre-industrial levels by the end of the 21st century,

¹⁰ For more information, see www.ipbes.net/global-assessment-report-biodiversity-ecosystem-services.

Figure 5
Impacts of climate change in the Asia-Pacific region



Source: Graphic reproduced from Figure 24-2: Hijioka, Y., E. Lin, J.J. Pereira, R.T. Corlett, X. Cui, G.E. Insarov, R.D. Lasco, E. Lindgren, and A. Surjan, 2014: Asia. In *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, V.R. Barros, C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White, eds. Cambridge University Press, Cambridge, United Kingdom and New York, p. 1335. Available at www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap24_FINAL.pdf.

"Climate change is projected to increase the frequency and magnitude of regional hazards, including tropical cyclones, high-intensity storms, droughts and floods, making Asia-Pacific cities, especially those on coasts, highly exposed."

with stronger summertime warming over higher latitudes in Asia, where the temperature increase may reach up to 8°C (ADB, 2017c). Extreme heat particularly affects people's ability to work outdoors. In India, for example, extreme heat results in 4-6 per cent less productivity per hour worked (UNDP, 2016). In Jakarta, construction workers can earn the equivalent of between \$7 and \$10 per day – well above the national average – but they increasingly complain of heat exhaustion. On construction sites, temperatures now exceeding 37°C make daily work dangerous (Septiane, 2017). Many workers are day labourers and do not have health coverage if they fall ill.

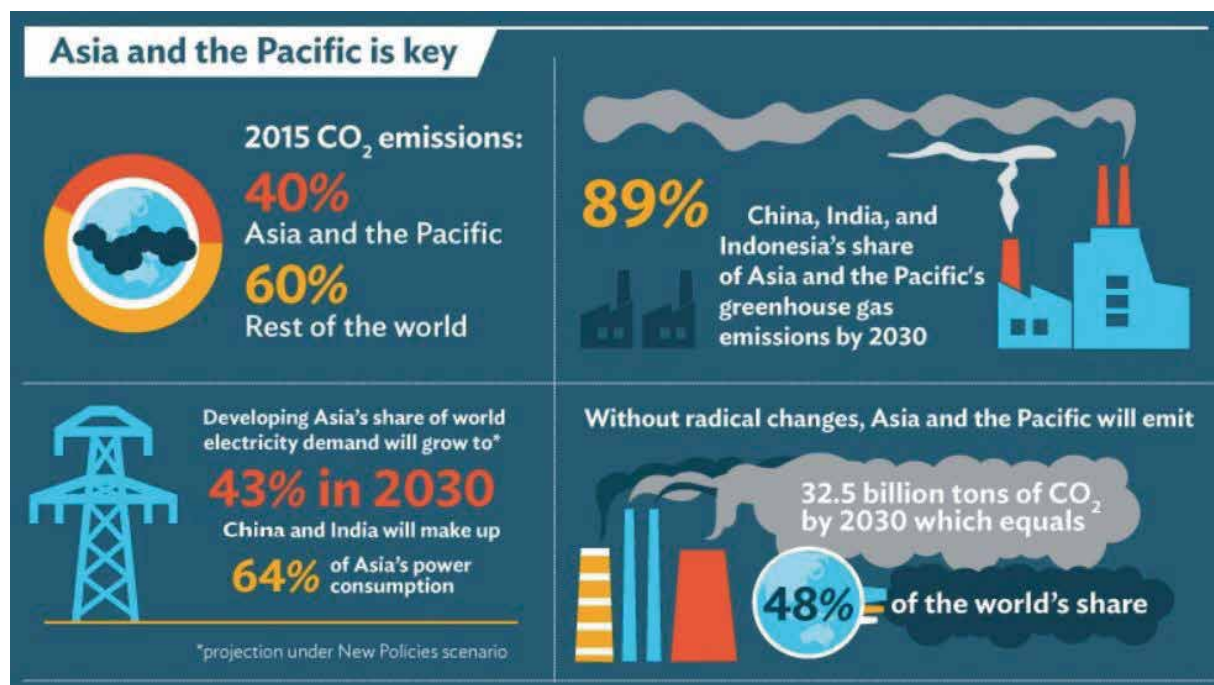
Sea level rise, chronic droughts and violent storm surges disproportionately have impacts on places where the most vulnerable have settled, such as on riverside plains, hillsides and suburban marshes. Some of the region's most economically successful places – Ho Chi Minh City in Viet Nam, Shanghai in China and Mumbai in India – are located on highly vulnerable sites that are predicted to be under water by 2050 under business-as-usual scenarios (Holder, Kommenda, and Watts, 2017). The threat of rising water is compounded in some of these cities that literally are sinking under their own weight in large part due to the overextraction of ground water, with Tokyo sinking by up to 239 mm per year (Deltares, 2015). Sea level rise could be limited to 0.65 metres by the end of the century if the Paris Agreement targets are met but will rise by up to 1.4 metres under a business-as-usual scenario (ADB, 2017c, p. xi). However, because sea level rise is a slow onset impact, even if global warming is limited to a rise in temperature of no

more than 2°C, sea levels could continue to rise by more than 5 metres over the ensuing centuries (ADB, 2017c).

In 2018, almost half of the 281 natural disaster events worldwide occurred in Asia and the Pacific; of the 10 deadliest natural disasters worldwide, 8 occurred in the region (ESCAP, 2019d). Climate change is projected to increase the frequency and magnitude of regional hazards, including tropical cyclones, high-intensity storms, droughts and floods, making Asian and Pacific cities, especially those on coasts, highly exposed (ESCAP, 2017b). Pacific islands are exceptionally vulnerable to the intersection of climate change and urbanization, with some countries in the subregion facing an existential threat from sea level rise. Between November 2013 and June 2015, the Pacific islands experienced nine major emergencies caused by urban flooding, displacing 20,000 people and affecting over 300,000 more (ReliefWeb, 2016b). Sea level rise will have far-reaching impacts, exacerbating overcrowding, worsening freshwater quality and increasing the risk of infectious disease transmission (McIver and others, 2014).

The worst projected impacts from climate change could be avoided if the world would rapidly decarbonize all sectors of the global economy. Although historically the Asia-Pacific region has not been responsible for the majority of greenhouse gases that have already been emitted, the region's rapid growth over recent decades and huge investments in fossil fuel production have resulted in Asia's greenhouse gases increasing by 330 per cent between 1970

Figure 6
Climate change in Asia and the Pacific



Source: ADB, 2017d. Available at www.adb.org/news/infographics/climate-change-asia-and-pacific.

and 2010 (IPCC, 2014b). With a 5.4 per cent increase per year from the period 2000-2010, Asia now has the world's highest GHG emission growth rate, outpacing the global average of 2.2 per cent per year (IPCC, 2014c, p. 358).

Limiting warming to the Paris Agreement's aspiration of a maximum increase in temperature of 1.5°C by 2100 requires net zero emissions globally by 2050 (IPCC, 2018a). This steep hurdle to climate change mitigation puts Asian urban dwellers at centre stage for necessary changes in the economy, energy choices, lifestyle and behaviour in addition to green investments and technologies. Cities globally contribute more than 70 per cent of energy-related carbon dioxide (CO₂) emissions (IPCC, 2014c), a share that will further increase in the future (International Energy Agency, 2016). Half of global emissions alone can be reduced if mankind builds climate-smart cities considering the emissions savings from upgrades to existing infrastructure, from

using new and energy-efficient infrastructure and the additional emissions generated by construction (Creutzig and others, 2016) and adopt strong policy actions with accelerated technology deployment to constrain urban energy use (International Energy Agency, 2016, p. 137).

However, mitigating climate change in a growing region is complex. As urban populations increase, Asian and Pacific cities are expected to see a rise in per capita energy consumption triggered by higher incomes, motorization, proliferation of consumer electronics and household appliances, higher food consumption and changes in dietary structure (e.g. meat consumption). Air-conditioning remains a particularly vexing problem as global warming drives demand for artificial cooling, which can strain energy supplies during periods of peak usage (International Energy Agency, 2018).



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In parallel with climate threats, cities must prepare for the social upheaval that is being driven by technology, automation and evolving social and demographic structures. Current resilience efforts must be scaled up for cities to grow sustainably within planetary boundaries while embracing technological, social and global change in a way that supports local solutions.

Addressing built-in stressors from within urban governance structures

Integrating climate action into governance structures and planning processes is highly political and constitutes one of the main challenges for building resilience. Addressing this challenge requires vastly improved decision-making processes that recognize the contributions of all urban stakeholders and that leverage the opportunities offered by new communications technologies. Decision-making methods, structures and remits are usually designed around institutions and political mandates and are often not designed or managed in relation to the resolution of external problems, such as shocks and stresses. Some of the region's largest urban agglomerations are made up of a patchwork of overlapping administrations, many of which are buckling under the pressures of urbanization and climate change. Metro Manila is an agglomeration of 16 different local government units. Jabodetabek

(Greater Jakarta) comprises nine administrative divisions.

Resource use and disaster risk management are often not coordinated across multilayered governing structures. "Siloing" or the separation of such administrative areas as housing, sanitation or climate change into departments with separate professional, management and planning time horizons is one of the main reasons for this handicap (Rode, 2016). Municipal amalgamation, intermunicipal cooperation and management or formation of metropolitan development authorities are ways in which government has adapted to this issue. However, whereas amalgamation sought to overcome arbitrary political boundaries, the concept of resilience enables the emergence of a more evolved understanding of cities as sited in natural contexts, such as watersheds or plateaux, whereby decision-making jurisdictions should be oriented around natural features. For example, the Netherlands has earned international acclaim for its water management boards, which work with its cities to ensure flood protection in a country where one third of land is below sea level (Metz, and van de Heuval, 2012).

Following the Dutch example, the Organisation for Economic Co-operation and Development (OECD) has highlighted how the majority of European Union members have successfully adopted intermunicipal mechanisms for water

"Resilience enables the emergence of a more evolved understanding of cities as sited in natural contexts."

management (OECD, 2012, p. 7). In Italy, Milan's experience on enhancing sustainability through urban water supply and sanitation services reform is likewise noteworthy (Lobina and Paccagnan, 2005). Intermunicipal cooperation has proven effective by providing a framework for collaboration as well as oversight from central Governments. In Germany, intermunicipal agreements allow the bundled provision of water, electricity and gas, providing economies of scale for the consumers, producers and managers of these resources, and greater resilience from a supply and demand perspective.¹¹ These examples highlight that Asian and Pacific cities

have much to learn from the experience of the European Union, which is codified in the "Urban Agenda for the EU", an integrated and coordinated approach to deal with the urban dimension of the European Union and national policies and legislation (European Commission, n.d.). By focusing on concrete priority themes within dedicated partnerships, the Urban Agenda seeks to improve the quality of life in urban areas. Based on the principle of subsidiarity,¹² the Urban Agenda is focused on the three pillars of European Union policymaking and implementation: better regulation, better funding and better knowledge.

. BOX 5

Supporting resilience to climate change in Asia – the European Union's contribution

Through the International Urban Cooperation (IUC) programme, the European Union is providing support to strengthening climate change resilience in Asian cities, especially in China, India, Indonesia, Japan, Malaysia, the Republic of Korea and Viet Nam. IUC provides dozens of pilot cities in the region with capacity-building and technical assistance while developing climate action plans that integrate mitigation and adaptation measures as well as promote access to clean and affordable energy. Efforts are aligned with national programmes in these areas and include initiatives to support innovation, data reporting and investment. This is part of the European Union's wider commitment to support the implementation of the Global Covenant of Mayors, the largest global alliance for city climate leadership, built upon the commitment of more than 9,000 cities and local governments. Support includes extensive involvement of the local communities' organizations and stakeholders.

Source: European Commission (n.d.).

¹¹ For details, see www.oecd.org/env/outreach/UKR%20IMC_intern%20exp.pdf.

¹² An organizing principle that matters ought to be handled by the smallest, lowest or least centralized competent authority. Political decisions should be taken at a local level, if possible, rather than by a central authority.

"Cities, no matter how small or large, need diverse economies in order to be resilient to economic shocks."

The region's economic model exposes cities to multiple shocks and stresses

Despite the economic success of Asia and the Pacific, the region has never been so unequal, with 40 per cent of the region's countries experiencing soaring inequality, notwithstanding a huge expansion in wealth over the past 20 years and the region's economic miracle also leading to record air pollution and overexploitation of water (ESCAP, 2018b, ppxiv). This rush to growth has clear impacts on the ability of Governments and communities to build meaningful resilience approaches. Spatial inequality plays out within cities as high-rise condominiums take precedence over social housing and as elevated highways are chosen over shared green space. The physical manifestations of these choices leave the region's cities particularly exposed to socioeconomic disruption.

Informality is also a reality for urban economies throughout the region. Millions of the region's urban poor suffer from shocks and stresses due to challenging work conditions, insecurity, low income and a lack of social protection (Satterthwaite and others, 2018). About 29 per cent of the region's urban population lives in informal settlements, and up to 80 per cent of people in South Asia and 65 per cent of people from South-East Asia work in the informal economy (ADB, 2014). In the Pacific, the use of informal land rights in certain countries can also exacerbate urban resilience challenges as conflict can arise between customary and national legal frameworks (Satterthwaite and others, 2018).

The region's cities could also become a victim of their own success. China's "upper-middle class" earning the equivalent of between \$16,000 and \$34,000 per year will potentially have expanded from 20 per cent of urban households in 2012 to 54 per cent of households by 2022 (Barton, Chen, and Jin, 2103). The resource use pressure on public services and natural resources is huge as more people are able to afford disposable electronics or goods such as fabric softener. South and South-East Asian countries that are following the conventional model of urban growth will also need to contend with the ramifications for urban resilience caused by more cars, more waste and more resource use. Short-term growth and prosperity that reinforces brittle or environmentally damaging systems of production and consumption is not sustainable and hinders efforts to make the region's cities truly resilient.

Cities, no matter how small or large, need diverse economies in order to be resilient to economic shocks. The impacts of economic crises, such as the one sparked by subprime mortgages in the United States in 2008, can affect cities on three levels. First, they cause declines in revenue directly affecting local governments' budgets, including transfers from national Governments. Second, an economic slump increases unemployment and increases social welfare needs, the burden of which falls on an already cash-strapped public sector. Third, a sharp decline in financing capacities makes it more difficult to get loans or solicit investment for capital projects (Paulais, 2009). Cities' abilities to recover from economic crises depends not



only on their efforts but also on what type of reforms central administrations have successfully promoted (Leisink and Bach, 2014).

Overdependence on a particular industry, employer or source of funding can increase the risk of economic shocks. For example, cities in China's Pearl River Delta have become highly dependent on manufacturing related to cellular phones,¹³ while in Bangladesh's cities, the garment industry is the mainstay.¹⁴ These places are particularly vulnerable not only to the changing fortune of these industries, but also to the ways in which economies are changing, and the risks arising from climate change impacts and other factors.

Technological disruptors: automation, digitization and the knowledge economy

As globalization has brought significant growth, it has also augured rapid technological changes that have major implications for urban resilience. There is keen interest among private sector actors and Governments on the possible impacts that technology, in particular automation, will have on the future of work (ESCAP and ADB, 2018). Mechanization and digitization are expected to disrupt economic growth, with significant implications for urban areas of the Asia-Pacific region (World Economic Forum and ADB, 2017).

Predictions diverge about the impending impact of automation, but the consensus seems to be

building around the idea that automation will cause the destruction of routine, low-skill tasks in global value chains and subsequently exacerbate poverty (OECD, 2017, p. 2). Up to 56 per cent of all employment in Cambodia, Indonesia, the Philippines, Thailand and Viet Nam is at risk from mechanization as companies seek to lower costs when faced with increases in labour costs (Chang, Rynhart, and Hyunh, 2016). This trend could disrupt the structural transition that many countries in the region have relied upon for building wealth. Cities grew as people left rural areas to take up low-skilled positions in factories, helping many to enter the urban wage economy. This conveyor belt to middle-class status is under threat as more and more sectors look towards increasing their share of machine-made goods.

The so-called Fourth Industrial Revolution and the emergence of the digital economy is also bringing disruption to work practices in the region's service sector. E-commerce is becoming increasingly popular, with companies such as Alibaba and Lazada, among others, replicating the success of such Western giants as Amazon. The Internet economy in South-East Asia is slated to be worth more than \$240 billion by 2025, more than tripling the current \$72 billion figure (Aravindan, 2018). E-commerce disrupts traditional ways of shopping that may have impacts on how cities develop by reducing demand for formal and informal commercial space along "high streets" when goods can be shipped in from distant locations at the click of a button. Assuming the Western model of warehousing takes hold in the Asia-Pacific region, e-commerce will not necessarily bring

¹³ For more information, see www.economist.com/china/2019/01/12/worries-about-unemployment-mount-as-chinas-economy-slows and the related podcast www.economist.com/podcasts/2019/01/31/visiting-iphone-city-el-salvadors-presidential-hopeful-and-angolas-diamond-auction.

¹⁴ For details, see www.ft.com/content/5cd0d9ea-d316-11e6-9341-7393bb2e1b51.

"Automation and the digital revolution are also pushing a diverse set of demographic and social changes that are having impacts on the resilience of economies, societies, cities, communities and households."

stable, secure work. Instead it may transfer insecure work from farm to factory.

The promotion by OECD of innovation-driven growth provides an interesting example for the Asia-Pacific region, such as the approaches already pursued in China, Japan and the Republic of Korea (OECD Committee for Scientific and Technological Policy, 2013). These economic development approaches look at building in diversity, with flexibility and greater local robustness, by connecting university research centres with locally grown industries and businesses to germinate knowledge-based value chains. Supporting knowledge-based economies and entrepreneurship will be essential for cities to become more economically resilient in the face of these global trends. There will also be real opportunities for cities in the region to leapfrog into higher-value industries and avoid automation-related employment loss.

Social changes and resilience: migration, ageing and changing gender roles

Automation and the digital revolution are also pushing a diverse set of demographic and social changes that are having impacts on the resilience of economies, societies, cities, communities and households. While rural-urban migrants would previously have tried their luck in the city without a job or housing offer, social media and mobile connectivity means that migrants, an increasing number of whom are women, are more easily able to find a job, housing and a social network,

as well as send remittances home, all using their cellular phones (Engblom, 2018).

There is growing literature on the gender dimensions of resilience-building, in particular the increased vulnerability that women face during natural disasters (Nguyen, 2018). There is also a countervailing argument that, as many women see their traditional role as homemakers evolve when they move as single migrants or as a family to urban areas, their economic inclusion and resilience to economic changes could be increasing (IOM, 2009).

Migration, especially domestically, is also shaping urbanization (ESCAP, 2017c). The wage gap between rural and urban areas drives rural-to-urban migration.¹⁵ While there are no reliable figures about the number of internal migrants globally, an estimated 743 million people worldwide are living within their national boundaries but outside their region of origin (United Nations, 2013). In China alone, there are at least 150 million internal migrants moving between cities or between rural and urban areas (Chan, 2013). The large increases in the number of internal migrants in the region's megacities are the result of migration, with 100 per cent increases in population in Shanghai, China, more than 50 per cent in outer Bangkok, and 40 per cent in Taiwan Province of China (Jones and Douglass, 2008). While the overall Asia-Pacific population is expected to grow, the region's rural population is projected to decrease (United Nations, 2017) as push and pull factors drive people to cities (Hoffmann and others, 2019).

¹⁵ For details, see the *Proceedings of the World Bank's KNOMAD Thematic Working Group on Internal Migration and Urbanization in collaboration with the Migratory Movements Research Unit of the University of Dhaka* Conference on Internal Migration and Urbanization held in Dhaka, Bangladesh, 30 April – 1 May 2014. Available at www.knomad.org/event/conference-internal-migration-and-urbanization.



Similarly, while much of the Asian economic miracle has been closely linked to the region's youthful population, many countries can no longer rely on the young "demographic dividend" for growing their economies. East Asian economies in particular have ageing populations, which gives rise to questions about unique and emerging sets of challenges that cohorts of older people have on the region. Japan, the Republic of Korea, Taiwan Province of China, and soon Thailand, have ultra-low total fertility rates of 1.4 – or fewer – children per woman; to give an idea of how low these rates are, it should be pointed out that replacement level fertility is 2.1 children per woman in developed economies.

In 2016, roughly 12.4 per cent of the region's population was 60 years of age or older, but this figure is predicted to grow by more than one quarter, rising to 1.3 billion older people in the region by 2050 (United Nations, 2017). While most countries in the region that are ageing are more developed, some countries, including Armenia, Georgia and Sri Lanka, are "becoming old before becoming rich", with population growth slowing before the demographic dividend can help the country to become wealthier (ESCAP, 2017d). On the scale of the city, administrations will have to rethink urban planning, accessibility and evacuation plans in order for older people to take part in contributing to more resilient futures.

2.2 Taking stock of the region's resilience-building paradigms

Local, urban, national and regional efforts to build urban resilience constitute responses of varying effectiveness to the diverse challenges that the Asia-Pacific region has been facing. A crucial question is how the wealth of experience generated thus far by this diverse community of practice can be further innovated, accelerated, scaled up and mainstreamed. Resilience approaches can act as catalysts by unsticking entrenched power systems, poor decision-making or inefficient administrations, as well as building multi-actor solutions to systemic urban challenges.

At the country level, climate public expenditure reviews (CPEIRs) produced by UNDP have highlighted national investments in climate resilience ranging from between 2.7 per cent of the total budget in Thailand and up to 16.9 per cent in Cambodia in the most recently analysed fiscal year (Miller, 2012). All CPEIRs have identified processes of decentralization as key to ensuring that climate change expenditures respond to location-specific contexts and reach the most vulnerable. Nepal has committed 80 per cent of its public resources for climate change



to be spent at the local level (Miller, 2012). In turn, in Bangladesh and Nepal, ministries of local government are the highest-spending agencies on climate change (Miller, 2012). However, in no CPEIR were climate change issues found to be integrated into local-level planning or budgeting. The climate-related initiatives of non-governmental and community-based organizations were reviewed to a limited extent as part of the CPEIRs but are likely also to have significant implications for how climate change and resilience interventions are coordinated at the local level.

The region is already replete with examples of communities building their own resilience by autonomously adapting to climate change and other shocks or stresses in order to survive (Seballos, 2012). For decades, families have been building homes on platforms or stilts and digging ditches or improving ventilation in order to adapt to changing weather patterns. It could be argued that the whole informal economy and people living in informal settlements are a story of resilience and adaptation to extreme hardship, albeit one that still results in high vulnerability to a range of natural and human-made hazards.

These organic, grass-roots characteristics of the region's cities must be included alongside some of the better-known examples led by the public sector.

Global agreements, such as the Sendai Framework for Disaster Risk Reduction, have guided national and local initiatives, which represent huge progress in the way in which communities and cities are supported. Below a typology is provided as a way of better understanding the major urban resilience-building paradigms and strategies in the region.

“Silo-busting” approaches that improve multilevel urban governance

Interdepartmental, inter-agency or cross-boundary issues are some of the core hurdles that impede urban resilience-building, in particular when considering climate change threats, such as droughts that can surpass city boundaries, technical capacity or water management planning. Breaking down silos or barriers, either through introducing personnel, planning or coordinated policy tools that enable

"A crucial underlying challenge for building urban resilience lies in finding the right scale of action."

public, private and community participation and mobilization, can help overcome these issues.

The city of Semarang, Indonesia, with support from the Asian Cities Climate Change Resilience Network has initiated various governance interventions. One project was focused on reducing the dengue fever infection rate, which had been steadily rising. The programme included a community-based dengue fever monitoring and information programme based around SMS alerts and a mapping system that provides a clear picture for local health authorities and communities (Asian Cities Climate Change Resilience Network, 2013).

In Surat, India, one of the world's fastest-growing cities, the local government's chief resilience officer played the role of a "silo-busting policy entrepreneur" across various scales (100 Resilient Cities, 2019b). For example, the Tapi River suffered from the city's rapid growth, less frequent but more violent rainstorms and water waste. As a result, piped water was available for only three hours a day. The city resilience strategy therefore was focused on water management to plan for an increase in both the quality and the quantity of the water supply. This resulted in a number of highly innovative approaches: adapting state-level regulations to enable rainwater-harvesting measures in the city, developing closed-loop water management approaches and promoting anaerobic purification treatments and sensors for smarter management. Surat has partnered with such cities as Rotterdam in the Netherlands to bring cutting-edge expertise to solve some of these water challenges, according to the

Coordination Unit of the International Urban Cooperation Programme (International Urban Cooperation, n.d.).

Breaking geographical siloes is also key. For example, urban development, rising seas and ever more frequent storm surges in Viet Nam threaten Da Nang's aquifer with saltwater intrusion. Through its city resilience strategy, Da Nang's chief resilience officer worked with a neighbouring province to form a shared platform for managing the Han River. This outcome led to a joint watershed management strategy that will focus on flood management measures and economic development (100 Resilient Cities, 2017).

A crucial underlying challenge for building urban resilience lies in finding the right scale of action, whether the challenge is managing water resources to prevent drought or creating a national or regional framework that mainstreams protection against a flood or a tsunami. Least-developed countries and middle-income countries are all developing national adaptation plans (NAPs). A total of 113 countries globally also have urban priorities highlighted in their nationally determined contributions (NDCs) under the Paris Agreement.¹⁶ While building climate change resilience, these policies provide guidance on building economic and social resilience in parallel. The Philippines is a positive example of inclusive multilevel governance approaches to integrating climate resilience through the update of its National Urban Development Housing Framework.

¹⁶ For detailed information, see www4.unfccc.int/sites/NAPC/Documents/Supplements/NAP-Human%20Settlement.pdf



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. BOX 6

Mainstreaming climate change into urban-related policies through multisector and multilevel participation and engagement in the Philippines

The Philippines ranks highest in the world for vulnerability to tropical cyclones and scored third position in the Global Climate Risk Index of 2015 among most weather-affected countries. Studies show that projected sea level rise will likely affect 70 per cent of the 145 cities and 1,489 municipalities located in the coastal zone, home to more than 13 million people. The central Government recently updated the National Urban Development Housing Framework via a participatory, multi-stakeholder, cross-sector process. The Framework for the period 2017-2023 is built on climate-sensitive and resilience-focused urban development principles and strategies. This approach recognizes the complex nexus of climate change and urbanization. It is guided by the principle of “climate resilience as the basis of spatial structuring and sectoral development”. The Philippines Government took several key steps when drafting this framework, including the formation of inter-agency technical working groups and a review of existing policies and legislation. Sustained coordination between government organizations and agencies was also essential to developing, discussing and agreeing on the evidence-based context, as well as providing the agencies with inputs to learn about the linkages between urban development and climate change actions and constant dialogues among the practitioners.

Source: UN-Habitat Country Case Study: Philippines mainstreaming climate change into urban-related policies. Available at www.fukuoka.unhabitat.org/projects/asian_subregion/detail05_en.html.

In addition to NAPs, national urban policies (NUPs) can help Governments to focus economic, social and environmental planning around long-term, sectoral and spatial approaches to sustainable and resilient urban growth. Currently, very few national policies make the connection between urban resilience and national planning. NUPs are emerging as a key method for mainstreaming urban policy approaches across various government scales

(UN-Habitat, 2018). A national urban policy is intended to achieve better urban results by, first, helping to align sectoral policies that affect urban areas, and second, by developing an enabling institutional environment (UN-Habitat, 2017d). A national policy on cities is helpful because the majority of urban challenges are too complicated to plan for uniquely from within city hall or even an amalgamated regional authority (Barnard, 2015, p. 16). As of 2019, about 21 per cent of

"Micro, low-tech and nature-based approaches are becoming increasingly important as resilience practitioners recognize the lower cost of leveraging ecosystem services to protect cities against resource depletion and extreme weather."

countries in the Asia-Pacific region had "explicit" and coherent national urban policies while a further 21 per cent had a "partial" urban policy, generally aligning with global averages (UN-Habitat and OECD, 2018, p. 22).

Ultimately each country needs to determine its own approach to improving its multilevel urban governance. For example, China has orchestrated urban growth through strong control of land supply and spurring the real estate industry. This strategy has led to a greater consideration of urban resilience approaches, such as the Green Cities initiative in the Pearl River Delta or the "sponge cities" approach nationally (Jing, 2019). China contrasts with India's federal system, where state governments greatly influence urban governance. The constitution gives state and national governments the remit over land development, and land use is much more complex. Very different approaches are pertinent for building resilience in each of these countries, highlighting how approaches must be tailored to the political regimes in place: in such countries as India, the national and state governments act strategically to craft multilevel governance systems to allow city governments to assume their responsibilities for urban planning (Ahluwalia, 2017).

Recasting the role of nature and natural systems in urban resilience

Planning tools aligned under the Paris Agreement or Sendai Framework provide critical normative frameworks, while development banks provide

a pipeline of needed infrastructure that helps Governments build urban resilience. Along those lines, micro, low-tech and nature-based approaches are becoming increasingly important as resilience practitioners recognize the lower cost of leveraging ecosystem services to protect cities against resource depletion and extreme weather. Recent experience has also highlighted how these options are often more effective at supporting the urban poor. In Colombo, the city government recently decided to integrate wetlands into the city's development plan following increased flash-flooding events in rapidly expanding urban areas. After the city identified that 40 per cent of local wetlands had been degraded or paved over, it was decided that 2,000 hectares would be completely safeguarded from development (Ranghieri, 2018). Grey infrastructure (human engineered infrastructure) is being developed in some parts to support the optimum functioning of natural mangrove ecosystems. In parallel with this measure, the national Government has set up a ministerial-level agency that manages the highly urbanized Greater Colombo Region (Ranghieri, 2018).

Many cities are focusing on how they could support better food systems, improved water supplies, enhanced food security, food quality and diet across all socioeconomic groups by focusing on localized supply chains (International Sustainability Unit, 2015). In Kathmandu, the city's urban poor are regularly subjected to fluctuations in food prices because of poor transport connections, the predominance of food imports from India and increasingly climate instability leading to unpredictable supplies

"Employ nature-based, low-cost local approaches as a major part of the resilience toolbox."

of basic foodstuffs. In order to remedy this dependency, the city piloted rooftop gardens as a way of helping residents gain more food security. These projects also reinforce water security through rainwater-harvesting systems. In a similarly low-tech fashion, Indore and Surat in India tested various reflective rooftop treatments as a low-cost way of reducing heat stress without costly and energy-intensive air-conditioning (UN-Habitat, n.d.).

Such cases are less contingent on successful government policy than they are on the nexus of research, business and civil society as partners in formulating and bringing about affordable and scalable innovations that improve urban resilience with Government. As Governments and cities recognize that expensive infrastructure does not always build the resilience of the poorest groups, they have learned to employ nature-based, low-cost local approaches as a major part of the resilience toolbox.

Figure 7
Examples of urban nature-based solutions



Constructed wetlands for contaminant remediation and maintaining ecosystem services



Urban agroforestry to address challenges of land tenure, health, food security and unemployment



Rehabilitating mangroves to protect coastlines and island biodiversity



Combined natural and engineered infrastructure for water management

Local innovation for resilience from urban poor movements and networks

The Asia-Pacific region has a wealth of community-based grass-roots perspectives, which have cross-pollinated across the region through support from urban poor networks, such as the Asian Coalition of Housing Rights (ACHR) and the Self-Employed Women's Association (SEWA) (United Kingdom Department for International Development, 2011). According to Oxfam International (n.d.), they have built community resilience in the Asia-Pacific region by establishing community-managed funding mechanisms and localized decision-making agencies at the ward level.

SEWA shows the power of political organizing among the urban poor. The organization builds the resilience of women and their families working in the informal economy through a number of ways. The federation helps women to find markets for the products that are produced by the women's federations. It also supports market-oriented skills training and development so that women can earn higher prices for their products and tap into broader product types and evolving tastes. SEWA also has a housing trust, which aims to raise awareness concerning climate change and informal housing so that women can help adapt their homes and communities to rising heat, disease risks and emerging water and sanitation challenges. The Urban Poor Development Fund (UPDF) in Cambodia organizes savings groups to fund household improvements in a country where there is no housing board, no ministry of housing



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and no legal means in place for legalizing or recognizing informal settlements (Phonphakdee, Visal, and Sauter, 2009). Born from an organized squatters' movement, UPDF connected with ACHR and was successful in replicating its model of community savings, housing upgrades and small-scale infrastructure projects (Phonphakdee, Visal, and Sauter, 2009, p. 574).

Government policy processes can sometimes treat the consultation with the urban poor as a box-ticking exercise. Such token gestures are missed opportunities. In reality, these groups have been extremely effective in connecting with international donors and professionalizing to become core actors of resilient urban governance regimes. Overall, these examples demonstrate how collective efforts of women's groups, architects and political leaders can form potent alliances.

"By coming together in transnational networks, cities have offered the possibility of an emergent political assemblage that can offer forms of governance that can match the scale and complexity of global challenges."

Realizing the future of urban resilience: gaps in the current community of practice

The region has hugely benefited from such programmes which leverage the multiscale challenges of urban governance. Multilevel, adaptive governance approaches must be enhanced and promoted. When reflecting, it is important to bear in mind that scale and typologies are key, and every context is different. Large metropolitan governments, such as those in Ho Chi Minh City, Seoul and Mumbai, will often have more efficient or different value systems compared with those of national Governments. Smaller cities are often in need of greater nurturing from central Governments.

Global city network advocates point to the problem of squaring politics with the pragmatic and urgent tasks of cities. The continued proliferation of city networks indicates that they do play a vital role in mediating between the strong economic forces that shape cities and the slower political mechanisms of Governments. Urban political scholars Curtis and Acuto (2018) argued that "by coming together in transnational networks, cities have offered the possibility of an emergent political assemblage that can offer forms of governance that can match the scale and complexity of global challenges". Equally, chief resilience officers across the 100 Resilient Cities network have argued that being able to point to other cities that are solving these hard challenges and to exchange experiences with officers in peer cities creates an enabling environment to push beyond the status quo and overcome inertia.

The tendency to rely on hard or "grey" infrastructure as a symbol of success and development is slowly giving much more weight to the measures and actions that are harmonizing with nature and ecosystems and looking for low-tech but more robust solutions. While nature-based or community-driven approaches are and continue to be more popular, there remains a significant gap in understanding the efficacy of these approaches in the long run. Promoting awareness of nature-based options, scaling up of best practices and driving social and political traction for these solutions are clear future priorities.

Critically, urban resilience efforts often lack adequate focus on the political economy and social aspects of urbanization. Current approaches still do not adequately address the unequal power relations between different groups and the environmental consequences of unplanned urban growth, such as in urban land allocation, provision of public spaces and selected provision of services. The aim should not be to increase the resilience of the existing systems where they cause vulnerability and risk, but to radically shift the ways urban systems work to increase the resilience of cities and communities.

This problem is evident from the lack of private sector-driven paradigms in the overview of regional resilience-building practice in the region. Perhaps with the altering of the development model through the Fourth Industrial Revolution, the rising interest in smart city applications, and the growth in awareness of the significant threats

"Embolden the private sector to play a greater role in future resilience initiatives in the region's cities."

that climate change and social disruption pose, private sector approaches will take on a greater critical mass as part of resilience-building. Cities

could explore ways in which they can invite and embolden the private sector to play a greater role in future resilience initiatives in the region's cities.





The future of urban & territorial planning



The future of urban resilience



2.3 Future policy pathways for urban resilience

The present report outlines four key future pathways to strengthen urban resilience in the region. Those pathways build on systemic planning and coordination across stakeholders, funding gaps, problems of scalability and policy consistency. To improve the resilience narrative, strong leadership is required that questions existing power dynamics, governance and resource allocation.

Specifically, the four proposed pathways are:

Scale up the use of nature-based solutions and resilient infrastructure in integrated urban and climate change planning

Understand the informal economy and support urban poor groups to be change agents for implementing city resilience actions

Create and strengthen partnerships to bring more attention and resources to long-term urban resilience strategies that break siloes between national, state and local actors

Utilize big data sources to connect communities, cities and regions and to improve local government technological literacy



The future of smart
& inclusive cities



The future of
urban finance

. 1

Scale up the use of nature-based solutions and resilient infrastructure in integrated urban and climate change planning

Nature-based solutions to addressing climate threats include ecosystem-based adaptation, but can also mean a retreat from high-risk inhabited zones and subsequent renaturing of land formerly occupied by human settlements. The goal of such approaches is to re-establish and maximize ecosystem services and to re-establish a connection with natural shared resources, such as water, food systems and land. Such an approach can effectively integrate urban and climate change resilience planning. Bangladeshi architect Kazi Khaleed Ashraf (2017) suggests recasting the understanding of the edges of the city “from its wet edge, ushering a conception of a city that is integrated with the delta” where “fluid dynamic structures of the city and its infrastructure and hydrological issues serve as starting points and frameworks for future urban planning and design decisions”. As waters rise, cities must find new ways of existing with water ecosystems: working with the water, rather than against it. Some sociologists have called for delegating “back to nature”, suggesting that city governance, paradoxically, may involve giving back some control over the urban environment (Sassen and Dotan, 2011). Nature-based solutions could be competitive in price with engineered solutions and provide local communities with valuable benefits that grey infrastructure projects do not (100 Resilient Cities, 2018). Green infrastructure also safeguards the livelihoods that are the

most dependent on ecosystems (Browder and others, 2019). Nature-based approaches require strong planning and innovation in order for them to scale, but the presence of participatory governance mechanisms in various contexts should be leveraged to expand this approach further. Crucially, highly stressed natural systems that exist outside of city boundaries should be considered as part of urban climate change resilience and nature-based policy approaches. Management mechanisms that can support this approach include national urban policies or the use of intermunicipal management structures.

. 2

Understand the informal economy and support urban poor groups to be change agents for implementing city resilience actions

The region's cities will benefit greatly by recognizing the scale and dynamism of the informal economy in order to build enduring urban resilience. The informal economy includes home-based workers, street vendors, informal day labourers and domestic workers. These groups are the poorest of the poor in cities and are the most vulnerable to all types of shocks and stresses. In the Asia-Pacific region, 68 per cent of employment is informal (ILO, 2018) although the positive interlinkages between the formal and informal economies are often not well recognized or reported (ESCAP, 2019e).

These groups are more likely to be exploited or victimized, and many are also connected



to international supply chains, in particular in the garment sector. Street vendors typically suffer public prejudice among policymakers, with a major reason being that these groups are seen as not contributing high-value goods and services to a city's economy. The view that efforts should be made to reduce informality is pervasive in the region but can often lead to punitive or exclusionary measures that do nothing to remedy the root causes of informality (OECD, 2018). Cities and national Governments have a choice to support or hinder the livelihoods of these groups, and policies are needed to support informal workers' transition to higher value-added activities. In recent years, attitudes have been changing with greater understanding of the dynamism the informal economy brings. For example, movements have emerged in Bangladesh and Indonesia to support informal entrepreneurs and small business owners to access formal sources of financing (Roughneen, 2019).

Even with positive examples in the region, there is still a fundamental obstacle to scaling these efforts: anti-informality policies put into place by some national and local governments and a lack of vision about how these groups can be integrated into economic approaches that focus on skills and social protection. Building a bridge between formal and informal economies is crucial in order to build urban resilience.

. 3

Create and strengthen partnerships to bring more attention and resources to long-term urban resilience strategies that break siloes between national, state and local actors

Another necessary component for increasing urban resilience is to empower and advocate for national and state governments to build better tools to manage urbanization so that they can effectively pool scarce resources and build



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"The future of governance for urban resilience should be inclusive and encompass the transboundary nature of globalization, climate change and rapid technological development."

urban resilience at the national scale. The future of governance for urban resilience should be inclusive and encompass the transboundary nature of globalization, climate change and rapid technological development (da Cruz, Rode, and McQuarrie, 2019).

Currently, many cities continue to be in passive positions, such as waiting on state or national governments for decentralization or devolution while remaining dependent on attracting footloose capital through foreign direct investment. It is important to ensure that urban challenges are central to macroeconomic, social and environmental planning at various scales. In recent years, mayors' movements have emerged to undo this passive position, such as Urban 20, the Global Covenant of Mayors for Climate and Energy and the Paris Agreement local government action group. This development is promising for future city resilience-building, yet it must be realized that such movements in

Asia and the Pacific are weak and need to be strengthened.

Decentralization is a key challenge. Cities are not in charge of the entire economy; central Governments are in charge of countries' fiscal policies and as cities cannot often raise capital themselves, in reality they are often just reacting to urgent needs. Without meaningful decentralization, it is often not viable for cities to create new opportunities for resilience. The potential pathways to decentralization for cities in the region include building their capacities step by step, prioritizing economic diversification and attracting initial capital projects that build a tax base and enable local governments to exercise more authority from the central Government. The 100 Resilient Cities Network of chief resilience officers has been at the forefront of breaking down institutional siloes for more integrated responses which support efficiency and leverage financing.

. BOX 7**Building capacity and breaking down barriers within and between governments**

Across the 100 Resilient Cities Network, chief resilience officers are appointed by each city to lead the development of a comprehensive resilience strategy, using a globally consistent process. This process, which engages municipal leaders, government officials and the private sector, measures success not in the document that is produced, but in creating the conditions for advancing resilience priorities as cities begin implementing their strategies.

There is evidence that the cities following this process have experienced a reduction in the strength of the government siloes that promote ineffective solutions, duplication and inefficiency, with better collaboration across city, state, and national levels of government. More than 80 per cent of cities continue to have a formal chief resilience officer position or a resilience coordinating unit now even after the end of the two-year initial funding provided by 100 Resilient Cities Network, and cities have made changes to budgetary review procedures or leveraged funds for resilience-building efforts, including new regional loans, disaster recovery funds, foundation grants and municipal bond issuances.

Source: Institutionalizing urban resilience: a midterm monitoring and evaluation report of 100 Resilient Cities (Martin, and McTarnaghan, 2018). Available at www.100resilientcities.org/wp-content/uploads/2019/03/100RC-2018-Urban-Institute-Midterm-Report.pdf.

. 4***Utilize big data sources to connect communities, cities and regions and to improve local government technological literacy***

Urban resilience-building asks for systemic understanding of the connectedness of urban systems. Technology can be used as a way of understanding problems and facilitating horizontal and vertical decision-making across city departments, various levels of governance and between citizens.

While the major recommendations for building resilience resides in the public and civic realm, the private sector plays a catalytic role in building transformative change, in particular in technology

firms and emerging data science. Apps and smartphones not only help to crowdsource information for planning but also are expected to directly reach city dwellers for fast responses. The emergence of blockchain technology can support urban resilience by helping to “track and trace” genuine goods and ethical work practices, enabling smaller cities also to participate in global value chains (Hernandez, 2017). Blockchain can also provide clarity in consumer-producer relationships as well as between government agencies or between public, private, non-profit or community actors and as the backbone of a public ledger system for a variety of services. For example, they can document the transaction and thus support pricing in the regular grid or community micro grids drawing from solar rooftop panels in city buildings. These strategies



are still very niche and unknown to most cities in the region, and how to benefit from these is not yet fully understood but holds promise.

Governments need to understand and interpret big data, in particular as the high levels of technological penetration in the Asia-Pacific region continues apace. This goes beyond cellular technologies and includes pushes to digitize national economies, biometrics, the data entered in hospitals, data generated by smart meters in national utilities and so on. Big data are being gathered from social media, community-based organizations, websites and apps, as well as developed through the mapping of cellphone use, but also from all types of multimedia built through telephones. Having access to immediate, visualized data has the potential to enable

government actors at various levels to parse and access the same data and make shared decisions about complex problems overlapping various administrative functions, including planning for transport, building and energy services as well as soft sectors, such as financial management and the tax system. However, access to such data opens up questions related to surveillance and ownership; thus, privacy, and privacy and data protection laws, standards and codes of practice are necessary.



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Connected to this challenge is the need for public servants at various levels to be able to leverage technology and data as a public good. Integration of private sector knowledge must be facilitated for use by cities. Technology approaches can also bring down costs, improve procurement and increase transparency in general. Public appropriation of these technologies is key if trust in public entities is to be restored. About 25 per cent of India's GDP can be attributed to public procurement, with patronage becoming an increasing concern (UNODC, 2013). Use of technology and transparency in public procurement can improve the quality of the outcome and increase overall trust in systems. Cities should further move to problem-based procurement rather than product-based

procurement to leverage the expertise of the market and ensure that technological solutions are demand – rather than supply-driven. Transparency International has highlighted that digital procurement increases citizen and peer oversight over public projects and overall bureaucratic processes (Morgner and Chene, 2014).

Conclusion

The great challenge of resilience is that it is still a relatively abstract concept to many decision-makers in Asia and the Pacific. Due to its multisectoral nature, resilience is still difficult to frame and relatively complex to understand how it differs from more classic public policy tools. In parallel, the concept suffers from the “catch-all syndrome”, by which resilience seems to cover every aspect of urban governance and as a result suffers from a paralysis whereby it ends up covering nothing at all. The region must recognize the significant practice experience upon which it has to draw. This experience is imperfect, but it clearly points the way to the other groups that need to be taken into the “big tent” of multilevel governance: co-creating solutions with the private sector is key to finance, design, collaborate and lead urban resilience-building in the region.

Speed is key for efforts to increase urban resilience in the era of climate change. For mitigation, the challenges from delayed actions to reduce greenhouse gas emissions include the risk of cost escalation, locked-in carbon-emitting infrastructure, stranded assets and reduced flexibility in future response options (IPCC, 2018b). For adaptation, delayed action in the present may reduce options for climate-resilient pathways in the future, with current failures to address the effects of emerging climate stressors already eroding the basis for sustainable development and offsetting previous gains (Denton and others, 2014). Delay comes with huge penalties, not just in the increasing financial costs, but by making the problems even harder to solve: delay today means even greater, faster solutions will be needed tomorrow (Steffen, 2016a). Therefore, to avoid the disastrous impacts from shocks and stresses that are not under one’s control, speed must be embraced and fundamental, well-thought-out changes to urban systems that are both rapid and disruptive must be pursued (Steffen, 2016b). The region’s cities should keep the following maxim in mind: “Winning slowly is the same as losing” (McKibben, 2017).

Even as climate resilience occupies most of the attention for resilience practitioners, economic and social resilience are an important consideration and many medium-sized cities in the region are still working on the basis that they will be able to develop through foreign direct investment. This strategy is no longer assured. Local economic and social resilience must be recast and discussed more widely as part of building inclusive economies and places that are open to the world, but which must also rely on building their own capacities to anchor capital, labour and institutions that can lead the knowledge economy. Cities must rethink the purpose of and be more strategic in how they plan growth; resilience can be a useful lens through which to evaluate their development priorities.

The solutions identified in this chapter had to deal with enduring challenges but also have to enable Governments to reorient their urban policies in a way that positions cities at the forefront of resilience solutions. The Asia-Pacific region has already been a trailblazer in decision-making approaches that address some of the power imbalances playing out in its’ cities, and the results have generated world-class economies.

The popularization of smart city approaches discussed in the next chapter highlights that the application of some of these resilience approaches to urban areas will provide a particularly fertile ground for experimentation. This collaboration is particularly important as one looks towards the opportunities and challenges of the “Fourth Industrial Revolution”.





CHAPTER 3



The future of smart & inclusive cities

- . P100 **The 2030 vision for smart & inclusive cities**
- . P104 **Smart city applications in the Asia-Pacific region**
- . P118 **Future policy pathways for smart & inclusive cities**

CHAPTER 3

The future of smart & inclusive cities

3.1 The 2030 vision for smart and inclusive cities

In 2030, an Asia-Pacific mayor leads a tour of city hall for visiting dignitaries. With pride, the mayor shares how e-government practices have increased transparency, leading to better budget management and reporting efficiencies; these measures have resulted in greater staff retention and pride in their work. With the savings, the city managed to invest in an operations centre with digital maps showing real time public transport service efficiencies, transport conditions on the roads, rails and waterways. Predictive analytics enable the centre's traffic engineers to adjust speed limits, traffic lights, toll prices, reversible lanes and bus headways in order to ensure smooth transport flows. Another map shows data on piped water systems highlighting areas of stress or leakage, with an accompanying board tracking usage against water reserves.

The mayor then leads the group to the centre for citizen engagement, where several screens show summaries drawn from the city's municipal services smartphone app as everyday citizens report accidents, emergencies, utility leaks or illegal litter. These incidents are deftly dealt with by competent staff leveraging closed circuit television (CCTV) and artificial intelligence, and conveyed to the designated department or team for action. As they step outside, a department head highlights how sensors have been deployed to improve energy efficiency in street lighting, which has enabled them to extend their street lighting network to improve street safety to nearly 100 per cent coverage of the city. The group stands next to lush street greenery where children and parents are playing, oblivious of the sensors monitoring the greenery for water and nutrient needs. A nearby full waste bin initiates compression, while a signal is automatically sent to maintenance for it to be addressed.





As this anecdote shows, smart city technology that is inclusive and people-centred can be a reality for Asian and Pacific cities. Such deployments of technology and data analysis are all the more urgent given the unprecedented speed and scale of urbanization in Asian and Pacific cities, which has brought about numerous challenges, such as traffic congestion, air pollution and water shortages.

Cities are grappling with these challenges simultaneously with the onset of the “Fourth Industrial Revolution”, which brings both promises and pitfalls. Improving Internet and smartphone penetration has enabled unprecedented access to information and the ability to connect individuals. The vast amount of data generated in real time across the urban environment provides the ability to understand and respond more effectively and promptly to challenges in cities. Mobile web access for services such as ride sharing has triggered a lifestyle shift in cities. E-hailing and food delivery apps have created job opportunities with greater flexibility. These technological shifts are transforming the way people connect with one another, conduct business, provide

services and live their lives in cities. For city leaders, technological advancement offers numerous opportunities which can address urban challenges and help them make informed decisions effectively.

While the term “smart cities” has been co-opted by various interest groups to generate business, it merits a more rigorous definition and a set of guidelines among urban leaders. To that extent, the concept received significant endorsement with the establishment of official structures, such as the ASEAN Smart Cities Network (ASCN), a collaborative platform where cities from members of the Association of Southeast Asian Nations (ASEAN) work towards the common goal of smart and sustainable urban development. National Governments have also rolled out ICT and smart city blueprints, such as the India Smart Cities Mission (India, Ministry of Urban Development, 2015) and Indonesia’s plan to build 100 smart cities (Tarigan, 2017). The implementation of smart city visions, however, is not without challenges. Deploying appropriate technological innovations to solve problems at the municipal level also requires pre-emptive effort to establish the correct legal and

"The future of smart cities will be one where technologies seamlessly support more efficient work-life-play-learn opportunities for every individual in an inclusive manner, fuel greater economic growth and facilitate the creation of sustainable living environments in cities."

regulatory environment to encourage players from different sectors to contribute meaningfully towards the vision. To fully capitalize on the opportunities, Asian and Pacific cities will need to build up robust digital infrastructure, especially broadband connectivity, to support these smart solutions. A prerequisite requires cities to actively build sustainable partnerships and viable funding approaches for these solutions.

Most importantly, while smart solutions have the potential to facilitate improved urban performance, they are no panacea to all the problems that cities face. If not planned or governed well, smart solutions can cause just as many problems as they set out to address. For example, surveillance systems incorporate advanced facial recognition software and CCTV applications in an attempt to strengthen public security, optimize traffic, service city management and innovate social governance. However, the systems have generated controversy and concerns over citizen privacy (Cassiano, 2019). Consequently, smart technologies and data do not remove the need for good planning, governance, financial management and smarter use of existing data sets. These are essential safeguards to ensure that people are at the heart of smart cities.

This chapter reviews the status and defines future pathways for smart city development in the Asia-Pacific region, focusing on how technology has and can be leveraged to address urban challenges in cities. In addition to important enablers, such as funding and digital infrastructure, key institutional mechanisms are

necessary to support smart cities: a dynamic and efficient urban governance system, as well as an integrated planning and development approach with thorough implementation. It is envisioned that the future of smart cities will be one where technologies seamlessly support more efficient work-life-play-learn opportunities for every individual in an inclusive manner, fuel greater economic growth and facilitate the creation of sustainable living environments in cities.

Smart systems as urban solutions

Asian and Pacific cities vary widely in their digital readiness. As a result, applications of smart systems take a variety of forms, anchored by distinct smart city visions. India prioritizes infrastructure development in its 100 Smart Cities Mission, while the Republic of Korea wants more citizen voices to be heard in city planning and management. ASCN member cities have also prioritized different focus areas in smart city development to meet their cities' needs. For example, Makassar City, Indonesia, hopes to improve health service access via its mobile health clinic, Dottoro'ta, which is supported with a telemedicine programme (Ludher and others, 2018a). Johor Bahru, Malaysia, needs an intelligent water management system to serve 2 million people by 2030 (Ludher and others, 2018b). Phuket, Thailand, is in search of the next boost to address tourist pain points and enhance its tourism industry sustainably (Ludher and others, 2018c). Some smart city innovations involve cutting-edge breakthroughs, such as autonomous vehicles or applications of machine-

learning algorithms, while many also involve relatively simple and inexpensive digital systems in targeted applications, such as enabling data-driven traffic management or digitizing time-consuming, paper-based business licensing processes.

Built infrastructure is the foundation for a functional physical environment in cities. In particular, transportation infrastructure and services play a key role in connecting people to places where they work, live, play and learn. Emerging technologies, such as autonomous and electric vehicles, may provide unprecedented opportunities for more personalized and inclusive accessibility in the physical environment. Autonomous vehicles can potentially provide door-to-door service for city residents far from existing rapid transit lines or for people with physical disabilities, but the deployment of these new forms of mobility also warrants a rethinking of future urban forms that best support these new technologies. For example, will the proliferation of autonomous vehicles increase traffic and generate more demand for automobile-centric infrastructure? While such discussions remain theoretical, cities must plan now for the potentially disruptive arrival of autonomous vehicles on their streets, much as ride-hailing services, such as Uber, Grab and Ola, upended traditional taxi industries and caught municipal regulators off-guard. In the meantime, existing data sets made available through public transit stored-fare cards can provide insights for authorities to better plan for inclusive accessibility through collective rather than individual transport.



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As these ongoing applications prove, the term “smart cities” is no longer just a conceptual idea, and with technology operating at all scales, it is no longer a buzzword relevant only to more developed cities. Asian and Pacific cities’ experiences testify to the tangible benefits of adopting smart technologies and using big data to support decision-making. Dozens of smart solutions are available today, focused on virtually every domain of city life: mobility, social

"Many large-scale smart city projects tend to be costly and will remain only a vision without new sources of funding and a shared vision with investors."

infrastructure, built environment, utilities, security, community and economic development. Not only have these smart systems proven essential to the efficient delivery of municipal services, rich data sets gathered from networked devices that are now ubiquitous in highly developed cities have also offered unprecedented opportunities to understand, analyse and even predict how the various aspects of these types of cities function.

At the same time, many large-scale smart city projects tend to be costly and will remain only a vision without new sources of funding and a shared vision with investors. Asia-Pacific

private and public sector entities will have spent \$375.8 billion in 2019 on digital transformation, a harbinger of the enormous cost to come as part of the region's digital infrastructure investment needs (International Data Corporation, 2019). However, many cities may find it difficult to sustain large smart city projects without a strong economic backbone, proper municipal and legal measures to collect city revenues or mechanisms to spend revenue on the city's own growth. This illustrates the risks faced by cities in developing countries, which will be unable to deploy these technologies, leading to a compounded digital divide.

3.2 Smart city applications in the Asia-Pacific region

Enhancing mobility infrastructure for inclusive accessibility

Whether or not autonomous vehicles live up to their promise, most city dwellers circulate on public transport now and will continue to do so in the future. Data that reveals behavioural patterns can provide rich insights for transport planners to enhance mobility services that better serve residents' needs. For example, many Seoul residents travel the city at night, such as students, small business owners and night-shift sanitation workers (Seoul Solution, 2014). Pre-existing night bus routes, typically designed based on an empirical understanding of the desired

origins and destinations of night travellers, did not adequately serve the travel needs of these residents. Taxis were the only option, but they also charged late-night fees and sometimes refused to take passengers or illegally demanded overpriced fares in order to earn more profit. In 2012, the Seoul Metropolitan Government started to analyse cell phone data drawn from a local telecommunications provider to chart night-time travel patterns (Seoul Solution, 2014). The cell phone data were also overlaid with taxi ride data for planners to understand the pattern of traffic demands and plan the new night bus routes that best serve the travel needs of people.



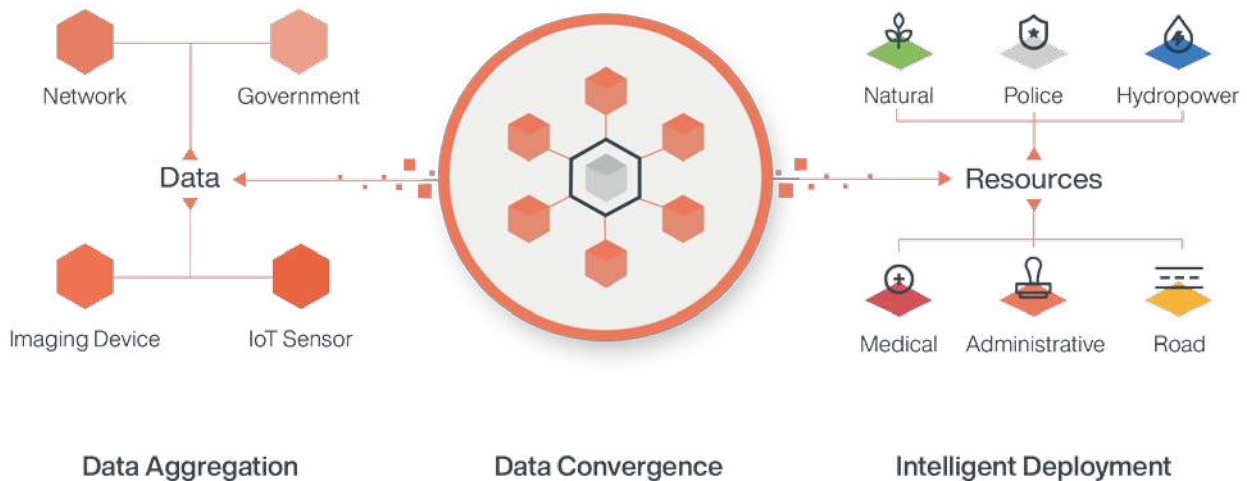
Source: Seoul Metropolitan Government, 2018. Available at <http://english.seoul.go.kr/seoul-to-operate-four-custom-year-end-owl-bus-routes-in-gangnam-and-hongdae/>.

The new night-time bus service provides a safe and affordable alternative. It has been well-received by the public, with continuous daily ridership growth – from 5,000 after launch in 2013 to more than 7,000 in 2014 (Seoul Solution, 2014). In a sign of the public's fondness for the new service, everyday citizens called for the overnight routes to have a unique name and generated the moniker “Owl Bus”, which the city in turn adopted in its official signage and branding (Lee, 2018).

Real time sensors coupled with big data analysis can also prove effective traffic management tools. Cities experiencing increased private automobile ownership rates and more vehicle miles travelled find that the resultant traffic congestion slows down urban productivity and generates air pollution. Chinese e-commerce giant Alibaba developed a cloud-based system called City Brain in its headquarters city of Hangzhou. The integrated platform deploys artificial intelligence to gather traffic data from the transportation bureau, video footage from

traffic cameras, location data of buses and cars from GPS and many others to learn traffic flows at more than 1,000 locations (Toh and Erasmus, 2019). While Alibaba developed the software, the Hangzhou city government owns the data. With an arrangement in place that ensures the public sector retains ownership of citizens data, in 2016 the city permitted Alibaba to control 104 traffic signals in the Xiaoshan district (Beall, 2018). Average travel time on roads with automated traffic signal controlled by City Brain has been reduced by three minutes. With City Brain, Hangzhou has also improved from 5th to 57th place among China's most congested cities. The system has now moved beyond coordinating traffic signals and has begun to automatically detect road accidents and illegal parking, facilitating more effective municipal responses to potential gridlock triggers. The City Brain system will soon be applied in Kuala Lumpur and several other cities (Beall, 2018). By contrast, the system has also been criticized for adherence to privacy protection, leading to concerns from the public.

ET City Brain



Source: Alibaba Cloud (n.d.). "ET City Brain – Empowering cities to think with data driven governance". Available at www.alibabacloud.com/et/city.

Improving the natural environment for a high standard of living

A clean, biodiverse natural environment offers a foundation for productive and sustainable economic development, enhances quality of life through ecosystem services and reduces the risk of natural disasters. Technology and smart systems enable cities to address environmental degradation and manage environmental resources in a more responsive and integrated manner. They also provide the means to promote sustainable consumption and production through information sharing. The collective efforts of Governments, industry and citizens are critical for formulating and effectively implementing sensible policy instruments and resource management plans.

Luang Prabang is situated at the confluence of Mekong and Nam Khan rivers in the Lao People's Democratic Republic. Wetlands play an important role in its natural drainage system and for food production, but much of this fragile ecosystem suffers from pollution and illegal encroachment from urban development. Wetland degradation

threatens residents' quality of life and puts the city under tremendous risk of flooding (Ludher and others, 2018b). The city is planning to roll out a rehabilitation plan for its 183 ancient wetlands and small ponds through its membership in the ASEAN Smart Cities Network. In its upcoming Master Plan for Urban Drainage and Sewage System, Luang Prabang plans to collect extensive data through sensors and geographic information systems (GIS) to closely monitor the condition of its wetland ecology, such as water levels and extent of urban development, in order to inform planning decisions (Ludher and others, 2018b).

In Singapore, more than 80 per cent of the people live in high-density public housing, and town planners are focused on providing a liveable environment in these council estates (Singapore Housing and Development Board, n.d.b). In 2014, the Housing and Development Board (HDB) announced its Smart HDB Town Framework, which envisions how smart technologies and data can be seamlessly integrated into public housing planning, construction and management to support a more liveable, efficient, sustainable

"Predictive analytics pre-empt problems and optimize maintenance cycles."

and safe experience (Singapore Housing and Development Board, n.d.a). This vision starts from the process of planning and designing a housing estate, where micro-environmental modelling influences precinct layout and block orientation to best harness natural ventilation and solar energy-generation potential. Smart features, such as automated adjustment of lighting levels, achieve greater energy efficiency.

Predictive analytics pre-empt problems and optimize maintenance cycles. The ongoing pilot will integrate all data collected in a centralized repository with rich insights for better planning. As other cities develop council estates, Singapore's planning approach provides a model for getting important details right that will ensure the success of such housing schemes.



Source: Housing and Development Board, Singapore.



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Advancing industry and nurturing innovation

In Chinese cities, the rise of Internet innovations, such as e-commerce, cashless payment and all-in-one smartphone apps, provide unprecedented opportunities to transform and upgrade traditional industries, such as health care, education and tourism, for those who have the tools to use them. Many businesses are digitizing parts of their operations and bringing them onto these integrated platforms facilitated through QR codes and electronic payment functionality. In many places of interest, such as the Palace Museum (n.d.) in Beijing, visitors can scan a printed QR code to purchase admission tickets or rent an audio guide device. By paying with their electronic ID linked to WeChat or AliPay and subsequently scanning their tickets at the gates, visitors reduce time spent queuing for tickets and other services. Other sites of interest, such as the Mogao Caves in Shaanxi, rolled out innovative applications through WeChat in order to augment tourists' experience with 3D virtual sightseeing, thereby injecting vibrancy into a traditional industry (Tencent Technology, 2018). With the ubiquity of these apps, such tourism innovations can easily be adopted in other countries.

The story of Indonesian mobility start up Go-Jek is one where homegrown innovation can positively spill over onto other traditional industries. The company's name is a play on ojek, the Indonesian word for "motorbike taxi". Since its launch in 2011, Go-Jek has evolved from a ride-hailing app to a one-stop platform that serves many lifestyle needs, ranging from food and grocery delivery to massages. In 2018 alone, Go-Jek is estimated to have contributed more than \$3 billion (44.2 trillion Indonesian rupiah) to the country's economy, benefiting drivers, small and medium-sized enterprises (SMEs) and individual merchants, all of whom now have another channel to promote and sell their products (University of Indonesia, 2019).

Advancing civic and social development

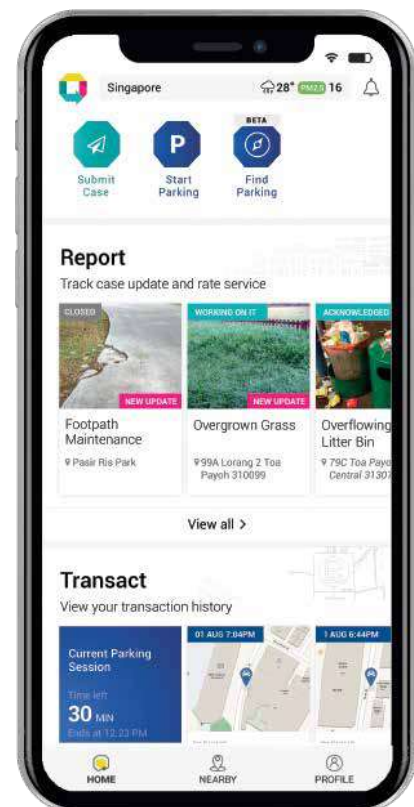
Asian and Pacific cities enjoy a rich mix of ethnic diversity. Building a cohesive and resilient community is among the top agenda items of cities, especially in the face of rising fears of domestic violence and transnational terrorism. While social media platforms have been misused as a tool of division, spreading radical messages, they could also become a unifying

"Care must be taken, however, to ensure the security of integrated data systems to avoid eroding trust."

force that brings people together, fosters strong community ties and enables public authorities to connect with residents in order to hear feedback and address their concerns directly.

Traditionally, many government agencies and town councils oversee municipal issues, creating confusion when residents might knock on the proverbial wrong door when they wish to file feedback or make a request. Using an integrated municipal services app, Singapore has successfully re-engineered the municipal service workflow across agencies and town councils. In 2015, the OneService App was built and implemented by the Municipal Service Office, under the Ministry of National Development, to better coordinate municipal service issues. The app offers a one-stop platform for residents to provide feedback on all municipal issues, upload relevant photographs and include a geotag of their location (Smart Nation Singapore, 2019). These issues will then be automatically routed in real time by a central back-end integrated case management system to the corresponding responsible agency or town council for follow up. Residents can track the status of their reported feedback cases, fostering greater transparency and enhancing trust in the agencies' and town councils' ability to address their concerns. Usage of the OneService App has increased by almost threefold from about 4,000 cases per month in 2016 to close to 12,000 cases per month in 2018.¹⁷ Besides enabling residents to conveniently report on municipal issues, the OneService App has also integrated transaction-based functions, such as Start Parking to enable drivers to conveniently pay electronically for kerb-side, coupon-based

parking, and Find Parking for motorists to find nearby car parks and check on availability and parking rates at their destination. These municipal service apps are increasingly de rigueur in larger cities and represent a comparatively simple and straightforward smart city application that could benefit residents. Care must be taken, however, to ensure the security of integrated data systems to avoid eroding trust. The Petaling Jaya City Council provides an illustrative good practice in pioneering the development of an integrated data platform for smart city development.



© Ministry of National Development, Singapore.

¹⁷ Data obtained from the Municipal Services Office of Singapore's Ministry of National Development.

. BOX 8**PJ Smart City's data solution platform**

The PJ Smart City initiative of Petaling Jaya City Council in Malaysia is a citywide project that is aimed at creating a “smart, sustainable and resilient Petaling Jaya” by 2030. As Petaling Jaya continues to modernize and its landscape evolves, the Council wants it to develop into a smart city so that it is able to better serve its citizens.

PJ Smart City provides a total solution platform for planning, managing and monitoring Petaling Jaya City using smart approaches through storage and analysis of large integrated data sets. At the PJ Smart Centre, city managers monitor traffic, air quality and governance in a streamlined fashion across multiple agencies. With the help of GIS, the PJ Smart City initiative is also tracking several key performance indicators that are aligned with the Sustainable Development Goals: provide all single mothers with skills training; reach 90 per cent compliance with assessment tax; ensure no more than 3 per cent of the population is affected by floods; reach a more than 85 per cent level on the happiness index; plant 1 million trees; ensure 95 per cent of public toilets receive a five-star rating; and increase the outcomes of the 3R waste programme by 3 per cent every year.

Source: Case study submitted by Urbanice Malaysia, 2019.

Improving health and well-being in a smart city

Healthy lives and well-being are a priority for sustainable urban development, especially as urban populations enjoy longer life expectancies. Many cities are working to provide all residents with affordable and accessible health-care services, a goal that has typically been impeded by financial and labour constraints. With innovative, technology-aided solutions, cities have found new ways to provide a larger segment of the population with affordable care. The advent of sensors and environmental and health data enable people to understand the urban environment and their own health in new ways. Smart systems have provided unprecedented opportunities for Governments to work together with people to create a better living environment.

India is working towards making health-care services accessible for everyone. This ambitious

goal has not been an easy task, especially for remote regions hindered by natural barriers and resource constraints. Since 2012, Hewlett Packard Enterprise has partnered with state health-care departments and local health-care providers to implement cloud-computing-enabled eHealth Centres in India (Hewlett-Packard Development Company, 2014). These centres, built in refurbished shipping containers for ease of transport and assembly, are connected to a partnering hospital through cloud-computing systems (Hewlett-Packard Development Company, 2014). The centres come equipped with basic diagnostic equipment and video conferencing capability, operated by a paramedic who assists patients with basic health-care services, such as measurements of vital statistics, and facilitates remote diagnosis with doctors from nearby hospitals through teleconferencing systems. Since 2012, 94 eHealth Centres have treated 525,000 patients in 18 Indian states, complementing the existing

"Urban dwellers are also now able to receive more updated information about environmental metrics that affect their immediate health."

health-care system with accessible primary health-care services in resource-poor locations (Centre for Liveable Cities, 2018).

Smart solutions have also helped to improve patients' experience of interacting with hospitals. In China, especially in cities strained by health-care demands, the act of visiting hospitals can be a painful and time-consuming experience that involves long queues, or worse, having to queue multiple times because the person seeking care initially registered with the wrong department. Wuhan Xiehe Hospital, a renowned hospital with 5.7 million outpatients annually, has created a public account on WeChat as have many businesses and institutions in China. The WeChat account functions as both a digital registration counter and an information repository. Users can select the department for which they would like to register, or be directed to the correct department through an online questionnaire that asks about their health status and current symptoms. The public account page also serves as a one-stop portal for all activities related to the hospital: users can view and retrieve past medical records, receive push reminders for medical appointments, pay for all fees incurred and even navigate within the hospital complex with a Bluetooth way-finding system. The adoption of this digital platform has significantly enhanced patients' experience of interacting with the hospital, reduced unnecessary waiting times and consolidated essential information onto one platform to better serve patients (Wuhan Union Hospital, n.d.).

Urban dwellers are also now able to receive more updated information about environmental metrics that affect their immediate health. Air Box is an Internet of Things air quality monitoring device that publishes real time data on its cloud platform for public access through mobile phones or the Web. Air Boxes can be installed in public spaces and schools as a complement to pre-existing air quality monitoring systems, which measure less frequently. Air Box data have sparked online scientific discussions on air quality among members of the public, who started pushing for stronger air quality enforcement measures. In schools, students have learned to read air quality indices and even develop their own air quality sensors (Smart Taipei Province of China, n.d.).

Empowered by smart technologies and data, cities are striving to create safer and more secure communities. Viet Nam's Ho Chi Minh City, faces the challenge of efficient emergency response as the city gets denser (Ludher and others, 2018d). Traditionally, essential data sets on such matters as transportation, public security, health care and education are stored by individual departments in inconsistent formats that are not interoperable to facilitate emergency response. The city has committed to building an intelligent operations centre and an integrated emergency response centre (Ludher and others, 2018d). By gathering data from numerous physical and virtual touchpoints, including citywide CCTV systems and government operation centres, the operations centre will consolidate the data sets to derive real time information about the city, enabling leaders to efficiently make decisions with a comprehensive view of

"Policymakers must target the basic access barriers, such as cost and availability, in order to ensure that smart cities do not further disenfranchise marginalized populations."

what is happening in the city. The city plans to further integrate disparate existing emergency response functions, such as firefighting, search and rescue and emergency medical services, into the emergency response centre in order to coordinate greater efficiency in communication and cooperation between multiple units. In this case, integrated data platforms have significantly enhanced the city's capacity to deal with emergency incidents.

Robust digital infrastructure and applications

Fundamentally, the smooth function of smart applications relies heavily on robust, secure ICT and digital infrastructure. Digital infrastructure, such as fibre-optic broadband and data centres, ensures basic virtual connectivity between people, companies and organizations. It enables delivery of solutions to remote and even resource-poor locations that are traditionally hindered by poor accessibility.

Asia-Pacific countries are investing heavily in telecommunications, broadband, data centres and other supporting infrastructure for economic and social development, with ample progress having been made thus far. The region has more than 2 billion Internet users, producing an Internet penetration rate of almost 52 per cent (Kemp, 2019). Japan and the Republic of Korea are leading the march with 95 per cent and 94 per cent Internet penetration rates respectively (Kemp, 2019). At the same time, of 18 ESCAP member countries with less than 2

per cent fixed broadband subscriptions as of 2016, 8 were Pacific island countries (ESCAP, 2018a). At current Internet access rates, smart city technologies are beyond the reach of many of the largest cities in the ESCAP region. It is therefore probable that the deployment of these applications will empower those who already have connectivity, while widening the gap with those furthest behind. Policymakers must target the basic access barriers, such as cost and availability, in order to ensure that smart cities do not further disenfranchise marginalized populations. In order to accomplish this, significant additional investment in digital infrastructure is still necessary to close the digital divide in the region.

User-centric applications and robust digital infrastructure can be the means through which services and solutions are channelled. Increasingly, mobile applications are evolving and agglomerating to become all-in-one digital platforms where services can be accessed and integrated. Super apps, such as WeChat in China, host online "microstores" for farmers, manufacturers, artists and small businesses, in an effort to enable individuals to be merchants, entrepreneurs and developers, no matter where they are living. The registration process for a microstore is designed to be easy and convenient. Development of a customized microstore requires minimal technical capability. Owners and developers can further improve their technical and management skills from online forums and training centres operated by WeChat's parent company, Tencent. Providing services and products to developers,



merchants and consumers, WeChat builds digital marketplaces that expand economic opportunities for multiple groups. However, limited data are available to determine the degree to which these efforts are succeeding; in addition, a gender divide exists in the use of these tools, highlighting concerns that vulnerable populations, such as female entrepreneurs, are being left behind by these efficiency increases. Responding to these and other challenges in the

Pacific, a shared digital platform to support more transparent and efficient land transactions has benefited city councils in greater Suva.

For those with access to connectivity, solid and accessible digital infrastructure and applications reduce information asymmetry between resource-rich and resource-poor locations, creating new social and economic growth opportunities. Services, such as education and

"Residents can contribute to larger resilience efforts without having to learn a new skill or technology."

. BOX 9

Technology comes to traditional land transactions in urban Fiji

In Fiji, 91 per cent of the land belongs to traditional indigenous landowners. The iTaukei Land Trust Board (TLTB), a statutory body established in 1940 to protect traditional landowners' rights, administers all land dealings on their behalf. As part of the Future Cities Programme's Supporting Smart Systems initiative, the Asian Development Bank developed a land price index, starting in Tailevu Province, to enable TLTB to become more effective and consistent in the leasing of land. A blockchain technology prototype is also being developed for integration into the new land price index. This prototype will provide an online service platform and a dashboard to retrieve and compare rent prices within surrounding localities. Innovative features of the blockchain prototype include: instant search function, quotes and application; detailed land, lease and price information; ability of land owners to vote directly and have full transparency on lease application status; and final confirmation and lease title issuance.

The project also developed a policy document for a shared digital platform across the four municipal councils in the Greater Suva Area. Councils are now able to share knowledge, information and services with each other. The application of data to address fragmentation across geographies is what truly enabled smart governance in this case.

Source: Case study submitted by ADB.

training, medical care, hazard monitoring and alerts, are made available and accessible to resource-poor locations with affordable mobile devices and data network access. In countries with stronger technology capability and competency, business has grown around data infrastructure, forming economic ecosystems built around digital platforms. The rise of numerous digital platforms continues to generate socioeconomic values in these countries.

Meanwhile, countries which do not have these resources fall further behind.

Traditionally, city leaders have convened platforms, such as public dialogues, polls and town hall meetings, to bring stakeholders together to discuss dedicated issues. With smart technologies, governance in smart cities can take on new forms and innovative channels to meaningfully engage stakeholders. For



example, Seoul's mVoting and "Oasis of 10 Million Imagination" allows its residents to vote on issues of concerns and give ideas to improve the city.¹⁸ These apps have been positively received as a form of meaningful consultation that builds trust between the Government and the people.

Smart technologies also enable residents to be involved as content producers to assist city management. Indonesian cities are making bold steps in engaging citizens in various aspects of urban management through social media. Jakarta is estimated to be the world's most active Twitter city (SemioCast, 2012). At the same time, Jakarta also needs "quick wins" to better manage its flood risk, reduce damage and provide an alert system. In 2014, the University of Wollongong, Australia, worked with the Jakarta Emergency Management Agency and Twitter to create PetaJakarta.org, an online platform which gathers real time flood reports from posts on Twitter by Jakarta residents, and visualize such data into an online map (Holderness and Turpin, 2016). During floods, Twitter users in Jakarta are programmatically prompted to tweet and post photographs using the keyword banjir or "flood" (Holderness and Turpin, 2015). Such flood reports would then be collected in a centralized geospatial database and rendered into a webmap showing geo-located flood information in real time across the city.

In February 2015, PetaJakarta mapped more than 1,000 flooding sites across the city, and the resulting map was viewed more than 160,000 times (Holderness and Turpin, 2015). Besides enabling residents to navigate dangerous flood

situations, the crowdsourced data also enabled the Government to perform flood assessment and response actions in real time (Holderness and Turpin, 2015). More importantly, the project demonstrated the value of crowdsourcing and social media to generate situational knowledge during extreme weather events; it shows that it has the potential to support larger-scale disaster risk management systems and achieve urban resilience in a cost-effective manner. Residents can contribute to larger resilience efforts without having to learn a new skill or technology. The example of PetaJakarta provides an exemplary model of how city leaders can leverage social media and crowdsourcing methods, made possible by the penetration of smartphones, to meaningfully engage and empower residents in urban resilience issues.

Integrated urban planning

Singapore has been making significant progress in incorporating GIS for integrated planning. One example is planning for an age-friendly city. Singapore is expected to have one senior (aged 65 and older) for every four other Singaporeans by 2030.¹⁹ Planning for ageing is thus a national imperative involving multi-agency efforts, such as the Ministry of Health, the Urban Redevelopment Authority, the Housing and Development Board and the Land Transport Authority (Singapore, Ministry of Health, n.d.). To ensure that the city provides older persons with sufficient medical and social services, planners across agencies have built in-house digital geospatial planning tools, such as ePlanner and GEMMA (GIS-

¹⁸ For details, see www.seoulsolution.kr/en/content/oasis-10-million-imagination.

¹⁹ For details, see https://sustainabledevelopment.un.org/content/documents/1525Action_Plan_for_Successful_Aging.pdf, p. 7.



Enabled Mapping, Modelling and Analysis) (Woon and Zainal, 2018). These tools enable planners across agencies to view digitized planning and demographic data, such as distribution of senior residents across estates, as well as locations of recreational facilities and aged-care facilities. By sharing such platforms, planners acquire a consistent understanding of planning issues and can better coordinate planning decisions across departments effectively. For example, planners can view all existing and upcoming facilities, then prioritize the development and social programmes in areas of high concentration of seniors and older persons who live alone. They can also make more informed decisions, such as co-location of the aged-care facilities with ageing social support centres, to better serve seniors' medical and social needs. Collectively, these GIS platforms have enhanced the planning agencies' capacity to make more coordinated and informed decisions across stakeholders for integrated planning.

Innovative key performance indicators for smart, sustainable urban development

Adopting an integrated and holistic urban planning approach supports cities in prioritizing their smart and sustainable development actions. Goris is a city of 23,000 people and the second-largest city of Syunik Province in Armenia. It served as a pilot for the United Nations Economic Commission for Europe's United Smart Cities Project, through which the regional commission and the municipality developed a smart city profile in September 2017 followed by concrete action plans (UNECE, 2017).

The city's performance was evaluated using 72 smart sustainable city indicators, which were grouped into pillars of economic, environmental and social sustainability (UNECE, 2017). These key performance indicators were unique in that they addressed both the smartness and



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"Adopting an integrated and holistic urban planning approach supports cities in prioritizing their smart and sustainable development actions."

sustainability aspects of urbanization, with a focus on localizing the Sustainable Development Goals.

The profile concluded that Goris should start to implement activities with lower costs while the city sought funding for more expensive priority action areas. This approach involved the planning of project proposals and discussions with private and banking investors. Analysts realized that a high level of cooperation among national Government, banking and the private sector is necessary for all the measures to receive stakeholder support.

The local government prepared a list of necessary measures to improve Goris' economic, environmental and sociocultural situation. Each measure was analysed according to its benefits, the resources required and whether the measure could be realized on a short-term basis. Based on this analysis, the measures were given a priority,

with scores ranging from 1 (highest priority) to 3 (lowest priority), and a benefits and resources/efforts score either in the high, medium, or low range.

Following the creation of the smart sustainable city profile, the list of key measures was translated into an action plan. This plan contains a clear list of funding sources and a timeline for the implementation of recommendations. Such a measure provides a transparent framework for sustainable and smart solutions to be implemented and regularly assessed against the key performance indicators. The recommendations in the city profile of Goris have been reflected in the city development plan and the Armenian Urban Development Committee, a national body overseeing urban policy (UNECE, 2017).



3.3 Future policy pathways for smart and inclusive cities

The future of smart and sustainable cities will require positive affirmative action being taken today and into the future. Key potential future policy pathways that could be adopted include:

- Improve smart city governance across urban systems, institutions and actors to overcome inequalities and make more informed and integrated planning decisions
- Encourage technology firms to become more civic minded and create sustainable smart city solutions with social enterprises
- Adopt cybersecurity safeguards in both digital and physical urban infrastructure development planning
- Develop smart mobility investment plans that prioritize sustainable urban mobility options for citizens
- Expand viable smart city funding mechanisms by enabling cross-sector sustainable partnerships and business matching platforms

. 1***Improve smart city governance across urban systems, institutions and actors to overcome inequalities and make more informed and integrated planning decisions***

To fully harness the opportunities offered by smart cities and to manage, balance and coordinate the various domains and priorities for a city's sustainable development, a systems approach towards creating a smart city is recommended. There are two systems in this approach: integrated master planning and development; and dynamic urban governance. Both enable new forms in the age of smart technologies.

Effective and integrated urban planning and development enables cities to manage the trade-offs and balance the different priorities in the development process, empowering cities to achieve balanced outcomes of economic development, high quality of life and a sustainable environment. This process requires drawing long-term plans that set out local development goals in various domains to align priorities across stakeholders. Up-to-date and comprehensive data enable the authorities to effectively resolve disputes and fraud cases involving land and property ownership issues and protect key infrastructure and resources in times of natural disasters. However, traditional paper-based land surveys and records can be time- and human resources-consuming, and quickly become outdated. In recent years, cities have adopted GIS to store, manage and visualize geographical information. In addition to visualization, digitized

data also support deepened analytics for more informed and integrated planning decisions.

A long-term and integrated development approach also fosters the discipline to build in flexibility to provide space for new opportunities that may arise. In planning for smart systems, it is important to consider the issue of interoperability as new technologies are being rolled out faster than ever.

Governance is about engaging diverse and capable stakeholders, such as citizens, government and businesses, including local enterprises and start ups, in decision-making and oversight of how the city plans, utilizes and manages its resources. It can take many forms, such as public-private partnerships and joint ventures.

Despite the innovative potential of smart cities to advance social, environmental and economic outcomes in cities, smart city governance raises significant issues for consideration. First, there is capacity for smart cities to create or widen existing inequalities. There is a risk that cities could invest in wealthier neighbourhoods when driven by market logic, based on economic potential rather than social needs. This attitude creates a perception of smart cities prioritizing business interests and reinforcing existing sociospatial disparities (Harvey, 2017). Smart cities may therefore marginalize farmers, informal workers, micro-entrepreneurs and small poor communities. A socially inclusive urban development plan is a necessity for smart city agendas. Inequalities can also develop when



smart technology applications do not bridge the gendered digital divide. Particularly in developing countries, minimal education, unequal access to resources and underrepresentation among decision-making authorities result in women being less able to access or use digital technologies (Intergovernmental Economic Organization, 2018). City planning must put emphasis on leaving no one behind, in accordance with the 2030 Agenda. This includes policies to ensure empowerment and participation of women in technology applications.

Vitaly, smart cities could infringe on individual rights to privacy, or human rights more broadly, such as freedom of speech or freedom of

association. Smart cities produce an abundance of data through the various monitoring of transport systems, air quality and CCTV, among many other applications (Powell, 2014). This risk is a governance issue which must be dealt with seriously given the potential for the misappropriation of open-access data. In this manner, smart city policies should bring a theoretical understanding of people's privacy concerns to the forefront in order to protect citizen's rights and curtail use by any party (van Zoonen, 2016). Anonymization of data alone does not fully address privacy issues, meaning initiatives must carefully consider data privacy laws and how to aggregate data to protect and guarantee user privacy.



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. 2

Encourage technology firms to become more civic minded and create sustainable smart city solutions with social enterprises

Universities attract high concentrations of young adult or student populations, making cities a hub for creativity, innovation and entrepreneurial environments. This presents an opportunity for city administrators to tap into unexpected ingenuity by co-creating solutions to problems in partnership with the technology sector. When provided with government data sources, talented software engineers can generate ideas rapidly at intensive coding sessions known as “hackathons”. Such programmes combine dynamic ideas from the academic sector with governmental support

and resources to foster innovative solutions to urban challenges. A longer-term engagement than a hackathon is an accelerator, which provides physical spaces and opportunities for technology start ups to advance their ideas to markets. The growth of social enterprise start up models is common across Asia and the Pacific, with the start up ecosystem having doubled in 2017; there are now 565 active tech hubs compared with 287 in 2016 (GSM Association, 2019). The start up landscape offers significant potential for Governments to harness creative thinking in order to drive solutions to citywide problems and for the technology sector to become more civically engaged.

"The start up landscape offers significant potential for Governments to harness creative thinking in order to drive solutions to citywide problems and for the technology sector to become more civically engaged."

. 3

Adopt cybersecurity safeguards in both digital and physical urban infrastructure development planning

Security and safety are vital challenges to cities, without which citizens will not embrace public space or feel comfortable using public transport. Besides safeguarding residents' safety, a secure environment is also crucial to cultivating investor confidence to fuel the region's economic development. Threats to safety and security are multifold. Traditional threats continue to loom, such as homegrown terrorism from the spread of radical ideas online and natural disasters catching a city unprepared. Moreover, as more business and social activities are conducted online, protection against cybercrimes and cyberattacks has added a new dimension to municipal security concerns. The growing pervasiveness of Internet usage in the region and rapid digitalization will increase the region's vulnerability to such cyberthreats.

With increasing transnational network connectivity and the reality of borderless cyberthreats, it is also important to enhance the cyber resilience and security of digital infrastructure, as well as physical infrastructure that is dependent on digital systems. In response to such threats, Singapore launched its cybersecurity strategy in 2016, outlining a comprehensive strategy to strengthen the resilience of critical information infrastructure to create a safer cyberspace, develop a vibrant cybersecurity ecosystem and forge strong international partnerships to enhance national

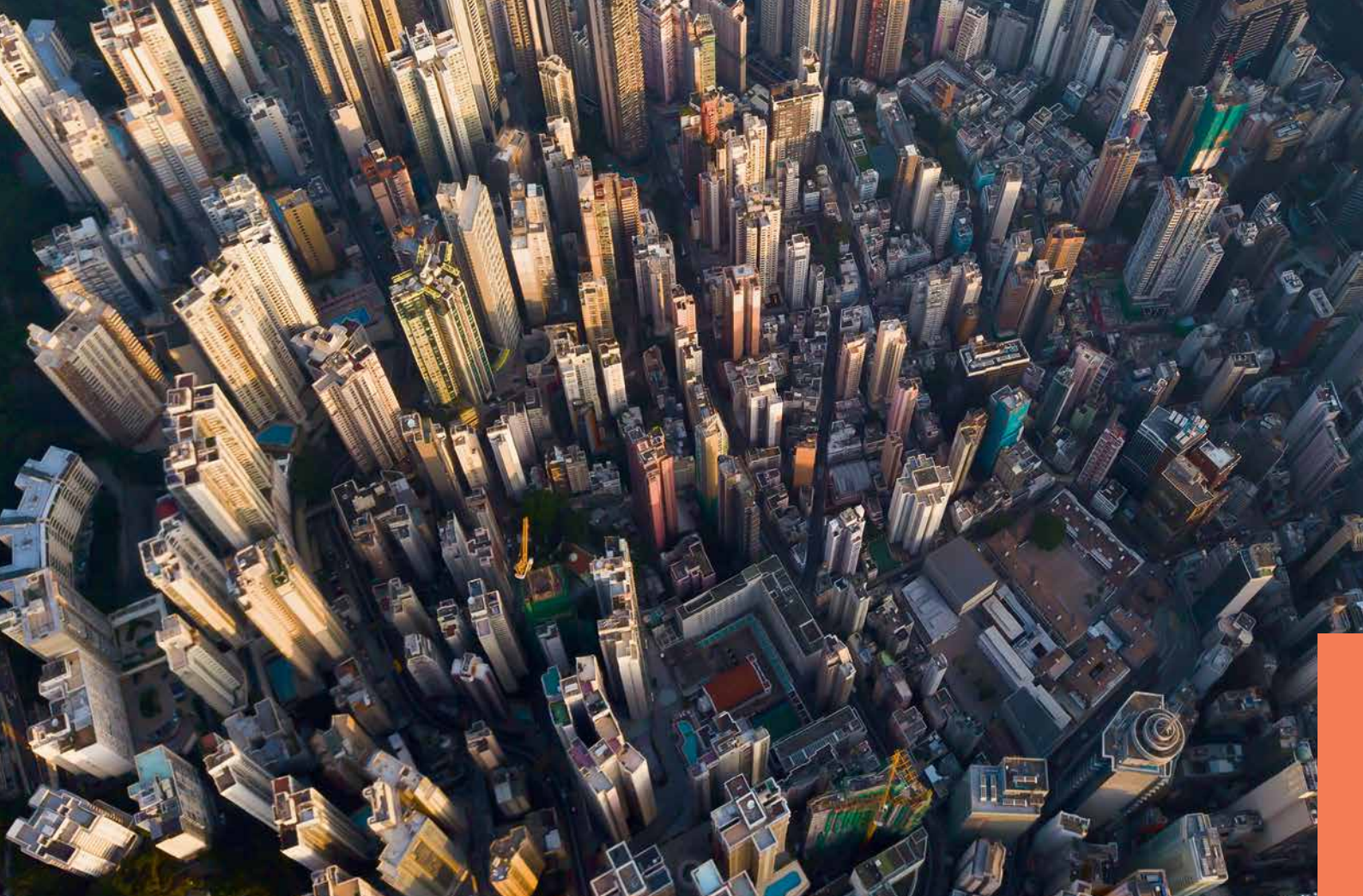
cybersecurity (Cyber Security Agency of Singapore, 2016). Cities in the region could consider formulating their respective strategies to prepare themselves against potential cyberthreats.

. 4

Develop smart mobility investment plans that prioritize sustainable urban mobility options for citizens

Increasingly, cities are exploring the integration of electric vehicles (EVs) and Internet-connected public transport into their mobility configurations. Both present benefits over current single-occupancy vehicle patterns. EVs reduce dependency on greenhouse gas-emitting combustible engines. However, while EVs could potentially change urban lifestyles with safer and more automated services that eliminate accident-prone human drivers, both technologies also require substantial rethinking of a city's infrastructure design to support wider adoption. EVs require charging points integrated with existing roads and power supply networks in order to spur wider adoption, but such investments are costly and time-consuming while demand remains relatively low compared with petrol-powered engines. For example, the Chinese city Shenzhen achieved 100 per cent electrification of its public bus fleet in 2017, yet the full emissions reduction potential of EVs has not yet been realized due to a lack of charging facilities (Dong and others, 2018).

Autonomous vehicles, on the other hand, could reduce traffic congestion as car-to-car



communication technology can theoretically permit vehicles to travel at high speeds with a shorter distance between vehicles as opposed to the more cautious distances required for safe human operation. However, autonomous vehicles may also require different road configurations and storage than existing parking facilities, especially if they circulate between journeys rather than remaining parked. For cities that consider shared autonomous vehicles as their viable future mode of mobility, they could start planning for and implementing regulations now that prioritize shared autonomous vehicles over individual ownership, as recommended by the Shared Mobility Principles for Livable Cities.²⁰ Not planning proactively for autonomous vehicles could have an adverse impact on urban congestion and draw needed revenue away from public transport. Finally, cities should be careful to continue prioritizing pedestrians, cyclists and public transport riders in urban design rather than creating more automobile-centric infrastructure.

. 5

Expand viable smart city funding mechanisms by enabling cross-sector partnerships and business matching platforms

Building physical and digital infrastructure often involves considerable investment and cross-sectoral partnerships. Cities frequently face significant barriers in technical know-how in order to meaningfully apply technologies. In this regard, it is worth looking beyond the public sector for additional support and resources in a mutually beneficial manner. By partnering with the private sector, research institutions and peer governments, cities can tap on these external resources for technical capability, financial support and valuable experience.

Private companies have been making tremendous progress in developing mature and market-ready solutions. These range from

²⁰ For details, see www.sharedmobilityprinciples.org/



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upstream planning and strategy consultancy to downstream engineering work and applications. Industrial partnerships can provide a level of expertise and efficiency to successfully deliver any smart city project. These partners can bring capability and competency that Governments lack, such as professional services, research experiences and opportunities for training and capacity development to the Government and citizens, and as a whole, enhance the authority's capacity to meet the diverse needs of residents.

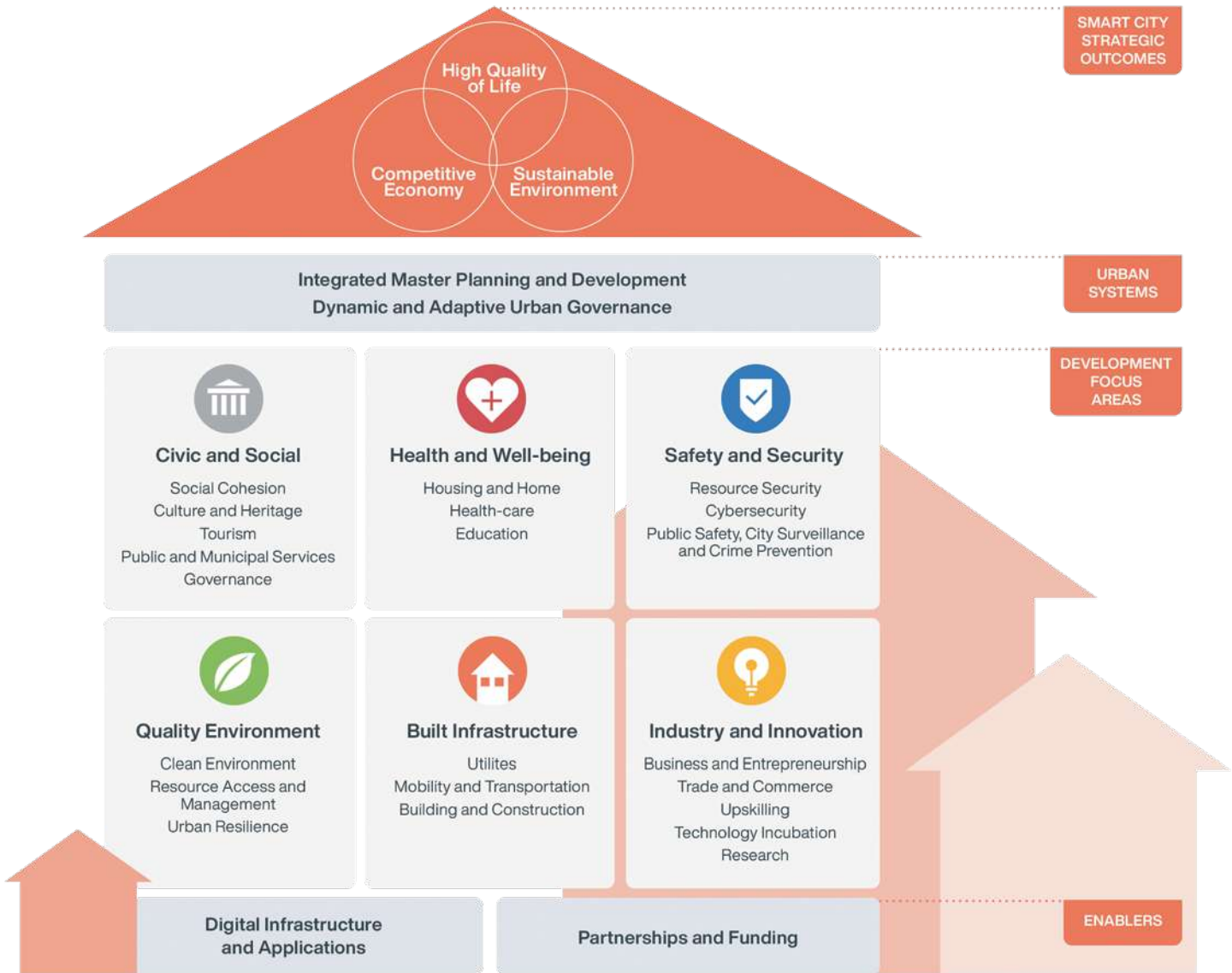
To best match resources with municipal needs, convening platforms that bring stakeholders together are important. Various partnerships have been established through ASCN,

connecting ASEAN cities with private sector solution providers and dialogue partners who are ready to invest and support. ASCN was set up in 2018 to synergize regional smart city development and facilitate smart city projects, with the first batch of 26 cities nominated by national Governments.²¹ Through networking sessions, a governance workshop and other programmes, ASCN provides a model that could be adapted elsewhere in the Asia-Pacific region. By November 2018, the platform had fostered 33 memorandums of understanding or letters of intent among ASCN cities, private firms and external partners. ASCN has proven to be an effective platform to foster effective business matching.

²¹ The first batch of ASCN cities are: Bandar Seri Begawan (Brunei Darussalam); Battambang, Phnom Penh and Siem Reap (Cambodia); Bangyuwangi, DKI Jakarta and Makassar (Indonesia); Luang Prabang and Vientiane (Lao People's Democratic Republic); Johor Bahru, Kota Kinabalu, Kuala Lumpur and Kuching (Malaysia); Mandalay, Nay Pyi Taw and Yangon (Myanmar); Cebu City, Davao City and Manila (Philippines); Singapore (Singapore); Bangkok, Chonburi and Phuket (Thailand); and Da Nang City, Hanoi and Ho Chi Minh City (Viet Nam).

Figure 7

The ASEAN Smart Cities Framework serves as a guide for planning and implementing smart city projects



Source: Centre for Liveable Cities. Available at www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf, p. 10.

Still, the journey will not be easy. Technology alone cannot deliver sustainable development and improve people’s lives. However, with good planning, governance and partnerships, it offers more opportunities than ever to deliver solutions to individuals, businesses and the public sector.

Such promises can be kept, however, only with a sustainable funding approach, which is the subject of the next chapter on urban finance.

Conclusion

The examples above serve to paint an optimistic outlook of how Asian and Pacific cities have been and will continue to address urban challenges with smart systems. The drastic cost decrease of Internet and mobile technologies and applications will promote the ever more pervasive use and integration of these systems in all aspects of urban life. Extensive usage of networked devices generates abundant data for analytics and will stimulate many applications for machine learning. For city leaders, these recent advancements provide unprecedented opportunities to understand their cities in fine granularity and to deliver urban solutions that could potentially have impacts on every single urban dweller in the most efficient way ever. In other words, what has been observed from most of these examples is how smart systems have enabled and empowered cities to make more informed decisions, break down barriers in service delivery and information and transform old methods into systems that are more efficient and effective.

Conversely, smart cities that are poorly planned and governed tend to cause more problems than they solve. In cases involving new and emerging technologies, there are also concerns over safety before the technologies become widely adopted. One example is autonomous vehicles, especially after a fatal self-driving incident in March 2018 in which a pedestrian was killed (Levin and Wong, 2018). Smart systems also significantly change the way workflows and divisions of labour are structured. Such process changes and the resultant new stakeholder relationship formation render irrelevant the legal and institutional systems that were built and designed around traditional workflows. As a result, smart solutions, such as ride-hailing, have raised safety concerns and share responsibility in many incidents. Most cities lack an adaptive legal and institutional governing framework for such new systems in general. At the same time, operating and managing smart systems and new workflows requires different skills and knowledge than traditional urban governance. The need for skills typical of the technology sector rather than municipal management explains why the social discourse around smart cities often brings up the “digital divide”. While smart systems have the potential to benefit cities, it is also important to recognize that smart systems are, at best, a means to an end. Without the relevant supportive systems and frameworks, they also have the power to distort the existing social fabric.

Besides the lack of proper legal institutions to govern these new service models, digitization of information and services also transforms the notion of “accessibility”. The prevalence of digital technologies in urban lifestyles changes the traditional means by which services are delivered and opportunities are accessed. As more services become digitized, accessibility to these services is determined by accessibility to, and the ability to use, digital technologies. Despite wide penetration of smart phones and the Internet, Asian and Pacific cities are still witnessing a significant digital divide (World Bank, 2016). Huawei’s Global Connectivity Index 2018 ranked Singapore 2nd and Bangladesh 78th for their respective performance over a broad spectrum of indicators for ICT infrastructure and digital transformation, among the 79 countries it measured (Huawei, n.d.). In India, Internet penetration was 66 per cent in cities, but only 25 per cent in rural areas, according to Kantar IMRB (n.d.). Even among urban dwellers, most of the unconnected population are from low-income households, socially vulnerable and publicly unengaged groups, such as the elderly, young children, the illiterate, the disabled and the unemployed. In addition to physical accessibility to the Internet and mobile devices through which digital information and services are channelled, the design of such smart systems could also hinder certain groups from taking advantage of these opportunities. There must be measures to humanize municipal technology, whereby feedback channels, citizen participatory processes and timely responses to requests contribute to shaping inclusive smart solutions. However, no universal guidelines currently exist.

Innovation is at the heart of smart city development, as cities strive to use technology creatively in master planning, building infrastructure, managing environmental challenges and delivering essential municipal services. Technological innovation is also key to industrial growth and competitiveness, which powers sustainable economic development.

Asian and Pacific cities have made considerable progress in harnessing smart systems to enhance their economic development, address urban challenges and create a sustainable living environment with a high quality of life for their residents. In this process, they have adopted diverse approaches and mechanisms that are customized to their specific developmental contexts. Smart cities are manifested in a variety of forms, ranging from large-scale and costly city-wide traffic camera systems to small-scale and relatively cheap smartphone applications for citizen engagement. The success of a smart city should not be determined based on how advanced the technology is, but on how such applications empower the city to solve more problems and develop towards a more sustainable future.

While cities have achieved varying degrees of success, challenges remain; this situation calls for cities to leverage the key enablers, such as viable funding mechanisms and collaborative partnerships, in order to enhance digital infrastructure. Increasingly, as cities build up their core infrastructure, priorities also evolve for them to become resilient against cyberattacks.

Beyond the practical solutions, the importance of good planning and governance is not to be neglected. The “smarter” cities get, the more planning and governance mechanisms need to adapt to regulate the use of smart systems and their applications in order to safeguard the public interest and ensure that development takes people’s interests to heart. When used well, they empower and equip cities with new capabilities and the capacity to achieve sustainable and resilient development for individuals. Success therefore requires a concerted effort from all stakeholders to plan and guide the use of smart systems in cities.

For cities in diverse stages of development, a framework that outlines broad approaches and principles to guide smart city development will be helpful. Such frameworks could assist decision makers to establish important mechanisms and systems, as well as drive urban development with a comprehensive and systemic view towards strategic outcomes. It is important for the framework to be adaptive to different economic, social and cultural contexts of cities as there is no “one solution for all”. One example is the ASEAN Smart Cities Framework, which identifies common development goals and key enabling systems for an ASEAN smart city, giving cities the room to implement projects that best address their developmental needs.

The New Urban Agenda is another existing framework committed to improving service delivery and adopting the smart cities approach (UN-Habitat, 2017c). It is committed to adopting a smart city approach that makes use of opportunities arising from digitization and technology. This approach can accelerate progress towards the improved delivery of urban services and the attainment of the Sustainable Development Goals.





CHAPTER 4



The future of urban finance

. P130

The 2030 vision for urban finance

. P134

Analysing the financing options for addressing the infrastructure gap

. P148

Future policy pathways for urban finance

CHAPTER 4

The future of urban finance

4.1 The 2030 vision for urban finance

In 2030, an Asia-Pacific mayor convenes a cabinet meeting and requests a full report in order to prepare for an upcoming speech on the state of the city. She wants to know what has changed in the last decade to enable her city to take more control over its financial situation. Having implemented many of the recommendations of this report, the mayor is pleased to find out from the housing secretary that the city's housing deficit has decreased dramatically due to a public-private housing scheme that built affordable multifamily flats in an underutilized parcel of land near the city centre. The public works director reports that a new district has sprung up along the river that runs through the city with all the necessary infrastructure – lighting, water, sewers, paved roads, public transport – already in place, paid for by a value-capture mechanism that collected money from the new district's property developers. Finally, the transportation secretary points to decreased city centre vehicle traffic after 10 years of a downtown congestion pricing scheme which has generated revenue that the city invested in increased public transport services.

As this hypothetical story illustrates, extending options for municipal finance is vital for the sustainable development of future Asian and Pacific cities. As well as providing all-important funding to help meet capital and operational expenditure requirements, these future pathways also help develop local financial accountability, ensure that the priorities and needs of the local community are met and assist with local environmental protection (UN-Habitat, 2016). Finance is the thread that ties together this report's forecast for future scenarios in planning,

resilience and smart technologies. Vital municipal efforts to implement plans for future growth, prepare for disaster and deploy new urban data-monitoring tools will not come to fruition without a strong foundation of financial security and the prospect of future revenue.

The municipal finance vision for 2030 will have a key difference from that of today. Intermediary cities, which currently struggle to access the existing global architecture for municipal finance, must be empowered to utilize those mechanisms.



"What can – and needs to – change is making these funding options available to as wide a variety of local governments as possible."

The vast majority of municipalities will typically enact some blend of grant, private or public equity, standard commercial or concessional debt and own-source financing. What can – and needs to – change is making these funding options available to as wide a variety of local governments as possible, especially intermediary cities that historically lack the capacity to pursue sophisticated fiscal tools. This urgent need means both educating policymakers as to how these financing mechanisms work and then giving them the skills and resources to understand how to apply them within their local context. Ultimately, local governments require the future pathways to access the finance necessary for construction and maintenance of their infrastructure and they can adapt their legal and administrative circumstances now in order to position themselves for future success.

The challenges and opportunities of urbanization

The New Urban Agenda recognizes that cities are drivers of development and local governments have a crucial role to play in order to foster global prosperity. While the impending urbanization of the coming decades is a major challenge in its own right, this forecast also presents an opportunity for local governments in these regions to learn from good practices adopted around the world and avoid the mistakes that

have taken place in more urbanized and better developed regions. This experience will be needed both to meet current infrastructure gaps and plan for future needs.

Although a definitive Asia-Pacific urban infrastructure financing gap measurement does not exist, one can approximate the scope of the need. The Asian Development Bank estimated that the region's developing countries need to invest \$1.7 trillion annually to keep their current growth pace, with Governments covering 40 per cent of the bill and the private sector footing the rest. With current annual investment at about \$881 billion, the gap is approximately \$460 billion, or just under half of total need (ADB, 2017a) (see figure 8). In 2019, ESCAP estimated that the region's developing countries need to invest an additional \$1.5 trillion annually to achieve the Sustainable Development Goals by 2030. This includes social and environmental infrastructure, such as hospitals and clinics, classrooms, water and sanitation, and conservation areas as well as transport, ICT and clean energy. Taken together, capital expenditures would make up nearly two thirds of the additional investment needed for achieving the Sustainable Development Goals (see figure 9). Much of these investments are expected to take place in urban areas.

Not all of this investment will require local governments to source the public sector share of the financing, but much of the infrastructure

"To meet this yawning infrastructure gap, new local-level initiatives supported by appropriate legal, city planning and financial frameworks will be required."

is likely to serve urban areas, with the best estimates on city climate finance indicating that 70 per cent of global low-emission and carbon-resilient infrastructure built through 2030 will be located in cities (Z/Yen Group, 2015). In turn, such estimates are hampered by their omission

of slum upgrading and public housing, which may account for the bulk of municipal spending. For example, China spent the equivalent of \$278.2 billion on shantytown redevelopment in 2017 alone (Chen, Yawen, and Beijing Monitoring Desk, 2018).

Figure 8
Estimated infrastructure investment needs by ADB region, 2016-2030

Billions of United States dollars in 2015 prices, climate-adjusted

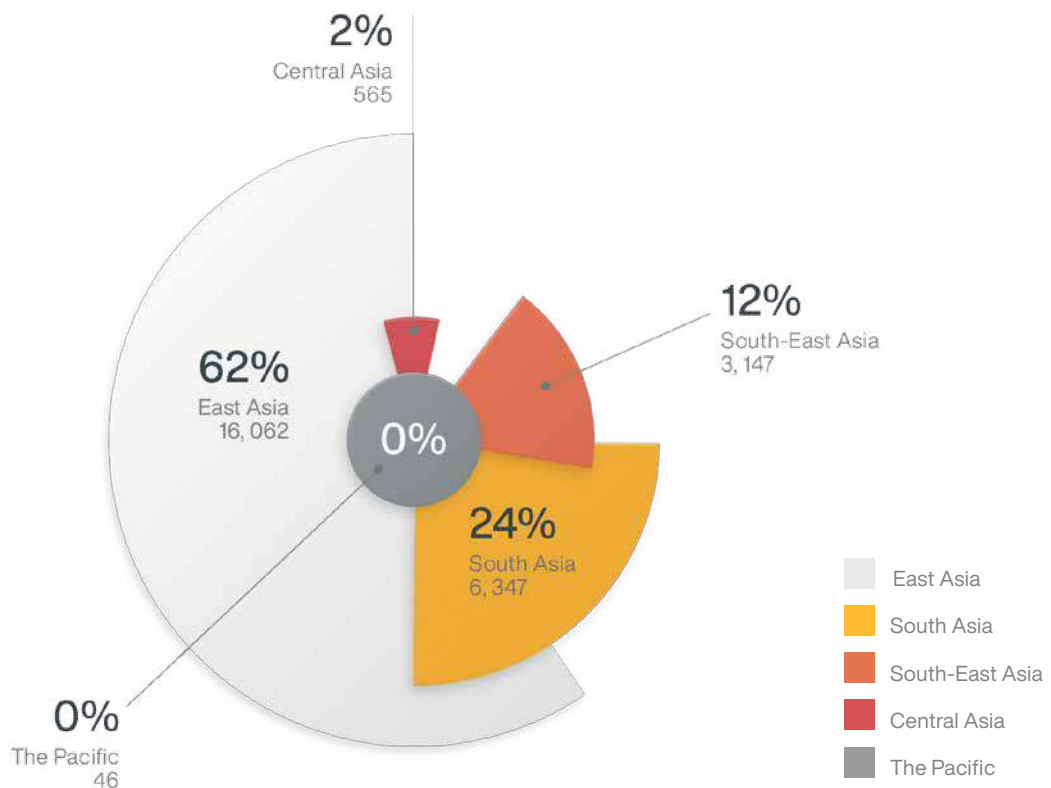
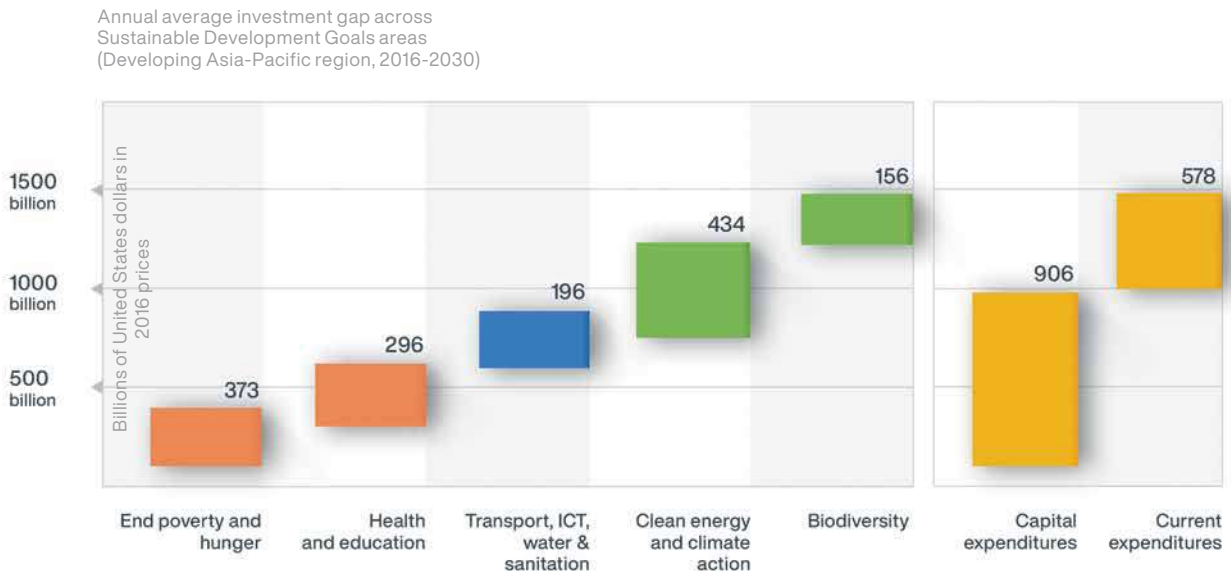


Figure 9
Sustainable Development Goals investment gaps



Source: ESCAP, 2019c.

In order to meet this yawning infrastructure gap, new local-level initiatives supported by appropriate legal, city planning and financial frameworks will be required, as indicated in the New Urban Agenda (UN-Habitat, 2017d). Improvements in traditional local government revenue sources will play the most significant part in helping finance this infrastructure gap, but there are also future pathways that policymakers should consider. These pathways are complementary to existing needs to secure transfers from the central Government proportional to cities' contribution to national GDP, improve creditworthiness to access international finance and develop bankable projects that will attract multilateral institutions.

Apart from the imbalances between cities' responsibilities to their citizens and their power to collect revenue, there are unfunded mandates caused by imperfect fiscal transfer rules. Namely, there is considerable variation in the share of these assigned revenues across and within countries, as well as in the predictability and timeliness of these transfers. There are also major differences in the shares and types

of own-source revenues that are allocated to local governments, including powers to assess, set rates, establish collection mechanisms and allocate efficiency rewards (Tax Policy Centre, 2018). The extent of powers transferred is clearly a factor that affects creditworthiness and risk. Reforms that improve the rationality of assigned sources and the efficiency and buoyancy of own-source revenues are necessary and already under way in many countries in the region.

Several of those alternative financing tools to provide funding for necessary urban infrastructure are addressed here: public-private partnerships, targeted levies or charges, land value capture mechanisms, municipal pooled financing and climate funding sources. While these pathways may not account for the largest potential share of revenue sources for local governments, they represent a toolkit that local leaders can develop simultaneously with more politically, legally and institutionally challenging efforts, such as negotiating larger transfers with ministries of finance or navigating municipal bond markets.

"While local governments in Asia still heavily rely on intergovernmental transfers as a revenue source, in recent years they have also been making endeavours to reduce the relative share of such transfers."

If local governments are to be empowered to take proactive decisions on infrastructure rather than perpetuate the status quo as passive recipients of scattered grants, these financing tools must go hand in hand with reforms to improve both assigned and own-source revenues. The intergovernmental fiscal transfer rules would need to be rational and predictable, without which planning at the local level would become impossible, especially in cities where

the size of assigned revenues is large. Further, apart from the absolute size of the transfers, the internal distribution between cities should be rule based. Further still, these reforms are a necessary first step for empowered local governments to leverage these public finance sources with private sources, as potential lenders would base credit decisions on the stability of the fiscal transfer rules.

4.2 Analysing the financing options for addressing the infrastructure gap

Analysing the options









Asian and Pacific cities' most pressing priority is to acquire productive revenue streams in order to assist with the reliable provision of basic services. If well planned, managed and implemented, own-source revenues can enable Governments to invest these resources in infrastructure that supports basic service provision.

While local governments in Asia still heavily rely on intergovernmental transfers as a revenue source (table 1 and figure 10), in recent years they have also been making endeavours to reduce the relative share of such transfers. This has been

to both reduce the national fiscal burden and support decentralization efforts more broadly. Meanwhile, property tax remains an important source of revenues for Asian cities (ESCAP, 2017a).

However, the different financing mechanisms upon which local governments rely do vary from each country based on the degree of centralization versus decentralization. In some cases, fiscal decentralization has been an efficient method for cities to raise revenues for increased expenditure on public services and infrastructure (UN-Habitat, 2017d). For example, Surabaya in Indonesia has pioneered

Table 1
Intergovernmental transfers as a revenue source for selected local governments in Asia

Country	Share of transfers in total local revenues (percentage)	Relative importance of type of transfer		
		Revenue sharing	General purpose	Special purpose
 China	60-66%			
 India	90%			
 Indonesia	90%			
 Japan	40%			
 Philippines	70%			
 Republic of Korea	40%			
 Thailand	85%			
 Viet Nam	50%			

■ High ■ Medium ■ Low

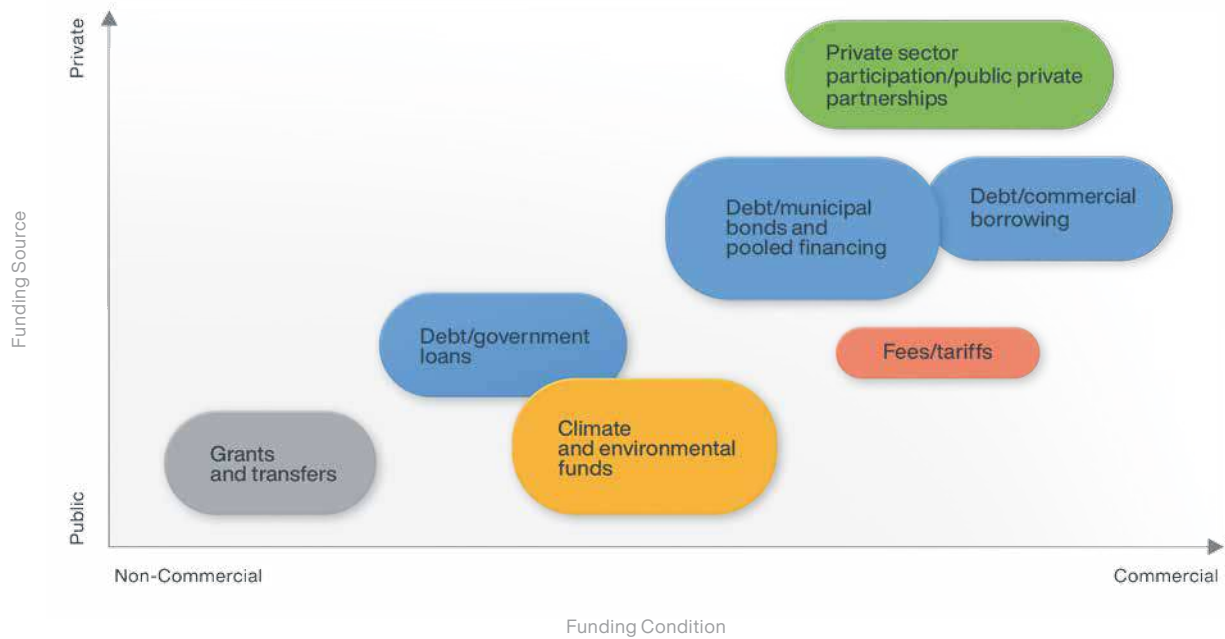
Source: ADBI, 2017.

an environmentally friendly urban development model with the benefit of the country’s regional autonomy laws (Bunnell and others, 2013). In other cases, such as in India and Indonesia, there have been enormous fiscal governance and revenue mobilization challenges associated with ambitious federalism reforms in recent years (ESCAP, 2018d). Meanwhile, some other countries have further strengthened central control over revenue mobilization. In 2015, China sought to replace a rather informal local government borrowing system with a more formal approach by converting some local government debt into local government bonds and merging a number of local tax authorities into the central tax

authority (Lin, 2016). Ultimately, fiscal autonomy is no more important than the ability to strengthen transparency, accountability and efficiency in revenue assignment.

Although there are potentially a wide range of financing options available to local governments, in practice these choices will be limited by a combination of the specific requirements associated with each financing mechanism and the nature of the local environment, that is, the relevant rules regulations and customs.

Figure 10
Infrastructure financing options



Source: Infographic by Stuart King, Senior Infrastructure Finance Specialist, Cities Development Initiative for Asia.

Table 2 presents a selection of the kinds of factors that will shape a local government’s choice of financing modality. Table 3 applies these criteria to the broad array of financing options available to local governments using a simple scoring process. This produces a shortlist of financing mechanisms – public-private partnerships, land value capture and fee charging – that are potentially available to local governments in a wide variety of contexts thereby addressing the “common (financing) solutions for common urban problems” theme that underlies the present chapter. These mechanisms are relatively new in relation to their application within the context of addressing some key urban challenges: housing, land availability and congestion/pollution within the context of an intermediary city environment in the Asia-Pacific region.

In the two tables that follow, five key enabling criteria – ease of implementation; relevance to intermediary cities; affordability/sustainability; expected scale/relevance impact; and positive secondary impact – have been identified that help determine the relevance and practicability of deploying alternative financing mechanisms within the urban context upon which this chapter is focused.

Table 2

Factors having impacts upon financing modality availability

Criteria	Criteria subcategory	Description
▶ Ease of implementation (resourcing/regulations)	Enabling regulatory framework	Degree to which the financing mechanism relies on a relatively complex set of enabling rules and regulations to be put into place in order to be effective
	Administration requirements	Expected human capacity requirements and/or institutional burden imposed in order for the financing mechanism to be implemented effectively
▶ Relevance to intermediary cities	Applicability to intermediary cities	Degree to which the inputs and outputs of the financing mechanism are expected to be suitable for smaller cities (i.e. the mechanism is relatively easy to implement and the scale of funding requirement is relatively small)
	Decentralization requirement	Extent to which the financing solution requires or does not require local government to have a high degree of autonomy
	Absence of a solution	Degree to which the financing solution might be expected to add to the range of funding mechanisms currently utilized by a city
▶ Affordability/ financial sustainability	Financial burden	Extent to which the financing option directly imposes a financial burden on local government versus the degree to which this burden can be shared with other parties
	Contribution to financial sustainability	Consideration of the degree to which the financing option can help cover operational expenditure (as well potentially as capital costs)
▶ Expected scale/ relevance of impact	Scale of expected impact	Degree to which the financing solution potentially targets and/or addresses the needs of a wide range of stakeholders (i.e. poorer households, women and children, marginalized groups, etc.)
	Level of need	Degree to which the financing mechanism is targeted at providing a solution to a critical infrastructure shortage
▶ Positive secondary impact	Externalities	Consideration of whether the financing mechanism will result in any positive or negative impacts outside of its direct intended purpose (e.g. improved institutional coordination)
	Link with other key themes	Degree to which the financing solution is reliant upon and/or helps deliver advances in governance, technology and planning

Table 3

Applying selected rationalization criteria to financing options available to local governments

		Ease of implementation (resourcing/ regulations)	Relevance to intermediary cities	Affordability/ financial sustainability	Expected scale/relevance of impact	Positive secondary impact
Grant	Direct	●●●	●●●	●●●	●●●	●●●
	Output-based	●●●	●●●	●●●	●●●	●●●
Debt	Concessional	●●●	●●●	●●●	●●●	●●●
	Commercial	●●●	●●●	●●●	●●●	●●●
	Market	●●●	●●●	●●●	●●●	●●●
Equity	Government	●●●	●●●	●●●	●●●	●●●
	Private	●●●	●●●	●●●	●●●	●●●
	Public-private partnerships (PPP)	●●●	●●●	●●●	●●●	●●●
Own source	Taxes	●●●	●●●	●●●	●●●	●●●
	Land value finance	●●●	●●●	●●●	●●●	●●●
	Fees/tariffs	●●●	●●●	●●●	●●●	●●●



Mechanisms for housing finance

Housing is a pressing urbanization issue that many developing countries are facing today. The World Bank (2010) estimated that 70 million new residents are being added to urban areas every year. UN-Habitat subsequently suggested that such population increases would result in dramatic growth in the number of people living in slums and informal settlements. At the global level, the number of people living without adequate housing will be 3 billion by 2050, if no action is taken right now (UN-Habitat, 2016).

Despite the challenges encountered in implementation, data show that PPPs and community schemes have helped develop a significant amount of housing for low-income and medium-income groups in target areas. In Kolkata, India, the Shukhobrishti Housing PPP Project in New Town Rajahat Kolkata specifically targets about 100,000 people (Nallathiga, 2018).

The Anupama project, meanwhile, comprises 1,400 dwelling units, of which 73 per cent have been set aside for low- and medium-income residents (Sengupta, 2004). As for community housing finance, by 2014 the Community Mortgage Program projects in the Philippines had assisted 271,660 families in obtaining loans for land purchase and housing development (Ballesteros, Ramos, and Magtibay, 2015).

On a much smaller scale, but of significance within its geographical context, is the Lagilagi housing upgrade project in Fiji. Operated by the Pacific Community Network, this project targeted the Lagilagi community in Suva, which is part of Jittu Estate and Fiji's largest squatter settlement with more than 2,000 households (ACHR, 2014). A group of 150 families in Lagilagi negotiated to collectively rent the 2.8 hectares of government land they had used for squatting, on a long-term lease worth the equivalent of \$235 per year. As part of the agreement, the families own



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"Housing is a pressing urbanization issue that many developing countries are facing today."

their houses but the land belongs collectively to the whole community. If anyone wants to move out, they have to sell their house back to the community who can then resell it to a new family. This project involved the first-ever housing partnership between a community of poor squatters, the Government and the community network. It combined funds from several sources: besides providing the land, the Government contributed funds equivalent to \$659,000 as a construction subsidy; the people contributed the labour and half the cost of the houses through their savings; an NGO, the Ecumenical Centre for Research, Education and Advocacy (ECREA), added the equivalent of \$612,000 in donor funds from Misereor; and a \$40,000 project grant from the Asian Coalition for Housing Rights (ACHR) supplemented the housing loans, through the Suva Federal Audit Office, or CDF. The two-story house model that the community members developed cost about \$11,000, of which half is to be paid for by the people (\$5,650 in instalments

of \$8.50 per week for 12 years) through savings groups and the city fund, and the other half is to be paid for by the government subsidy (ACHR, 2014). The money the people repay will go into the city fund, where it will revolve and enable more houses to be built. Although conducted at a micro-level, this positive example demonstrates the potential for such a model to be scaled up into larger contexts.

With proper and locally designed policy support, the Kolkata and Philippines' models (or versions thereof) could potentially target the almost 1.2 million slum families living in Mumbai (Praja Foundation, 2014) or the 1.8 million people living in informal settlements in the former capital of Myanmar, Yangon (ADB, 2018). For the case of Yangon, this would cost on the order of \$11 billion to provide every family an apartment unit and would take approximately 10 years to complete.²²

²² Estimated by consultants based on data provided in ADB, 2018.



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Housing public-private partnerships in Kolkata, India

The business model for Kolkata's housing PPP is a joint venture.²³ The public sector has several housing partners, including the West Bengal Housing Board and the Kolkata Metropolitan Development Authority, the equity shares of which range from 11 per cent to 49.5 per cent. In order to incentivize the private sector to participate, while also anticipating the potential adverse impacts on low-income groups, the partnership adopted a cross-subsidy approach under which some units are priced at or below cost and set aside for low-income residents while pricing for other units is left to the private developer to maximize market-rate return. The Government therefore makes decisions concerning the pricing of some housing units, as well as their size, location, construction quality and the kinds of amenities to be provided, such as enclosed shopping arcades and open space. In Kolkata's PPP scheme, at least 10-15 per cent of the units constructed will be allocated to low- or medium-income occupants. The prices for these units are set purposely low, thereby generating little to no profit while, as described above, the price for the remaining units, which will be sold to higher-income groups, can be set freely by the private sector to generate profit.

Housing has generally become more affordable thanks to government regulations relating to prices and minimum size requirements. For example, low-income unit pricing – ranging from 365 to 600 Indian rupees (\$8–13) per square foot – has dropped significantly compared with private housing offering similar size, flooring, location and other features. However, low-income residents still have limited access to housing finance options, such as low-cost and/or low-down-payment mortgages. Applicants' monthly income typically does not qualify for a mortgage, and they may not be able to present evidence of a regular salary, such as a tax return. Under such circumstances the Government needs to consider linking a mortgage programme for the poor with the PPP scheme.

The only private sector partners who have participated in Kolkata's housing PPP are builders. Although many private companies are eligible to participate, the Government has reached agreement with fewer than a dozen private partners even a decade since the introduction of the scheme. It is therefore recommended that the Government consider diversifying its portfolio of partners to potentially include NGOs, housing cooperatives, not-for-profit housing developers and other alternatives to the private real estate industry.

²³ This case is a summary based on a study conducted by Sengupta, 2004.

"Value capture comes in a variety of forms and can contribute to local government revenue, generate employment, contribute to the national economy and increase the city's fiscal independence."

Land linked financing mechanisms

Land value capture is a financial policy mechanism used to capture the increment in land value due to public investment (World Bank, 2018a). It is imposed where major infrastructure by the public sector increases the value of

adjacent land, sharing the cost of infrastructure among future beneficiaries (UN-Habitat, 2009). Value capture comes in a variety of forms and can contribute to local government revenue, generate employment, contribute to the national economy and increase the city's fiscal independence.

Table 4
Land value capture tools used by the public sector

▶ Leveraging public real assets	Disposition (sale or lease) of excess/underutilized public assets (land, property) for cash that is reinvested in local infrastructure
▶ Development charges	Developer receives development rights (or tenure rights in land, or approval of land use changes) in exchange for obligation to compensate in cash (or provide in-kind) the cost of certain items of public infrastructure benefiting larger area.
▶ Sale of development rights	Development rights or certificates of additional density are sold for cash to finance infrastructure improvements
▶ Land pooling/ readjustment	Land owners or occupants voluntarily contribute part of their land for infrastructure development and for sale to cover some project cost. In return, each land owner receives a serviced plot of smaller area with higher value within the same neighbourhood.
▶ Special assessments/ betterment levies	Locally administered tax increments (property taxes, sales taxes, etc.) that generate additional tax revenues for reinvestment in local infrastructure
▶ Tax increment financing	Capturing increases in property/land tax base (after infrastructure upgrades) and using such incremental tax proceeds as collateral and refinancing source for infrastructure loans

Source: Adapted from World Bank, 2018b.



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Land value capture tools, such as land pooling, can significantly ease the pressure on the Government to fully finance infrastructure delivery. It also represents a potentially useful alternative to solving traditional land acquisition issues, by facilitating public participation in future urban planning. The investment cost of the land pooling pilot project in Viet Nam was estimated to be 25 billion dong (\$1.08 million). While still ongoing, the project is set to upgrade the road network in the flood-prone area, which covers 24 hectares of land, 480 land users and 1,000 land parcels (Chen and Pham, 2017). In Nepal's case, 50 per cent of the project cost was covered through land pooling (Pradhan, 2017). The project benefited about 500 households, and the value of the 40 hectares of land also doubled after project completion (Pradhan, 2017).

Land pooling in Tra Vinh, Viet Nam

This land pooling and readjustment scheme,^{24, 25} was designed and implemented for a road construction urban upgrading project in Tra Vinh, aimed at minimizing forced demolition and resettlement. The plan was to cover 70–80 per cent of the total investment cost from land users and the remaining 20–30 per cent from the sale of surplus land. Although only two thirds

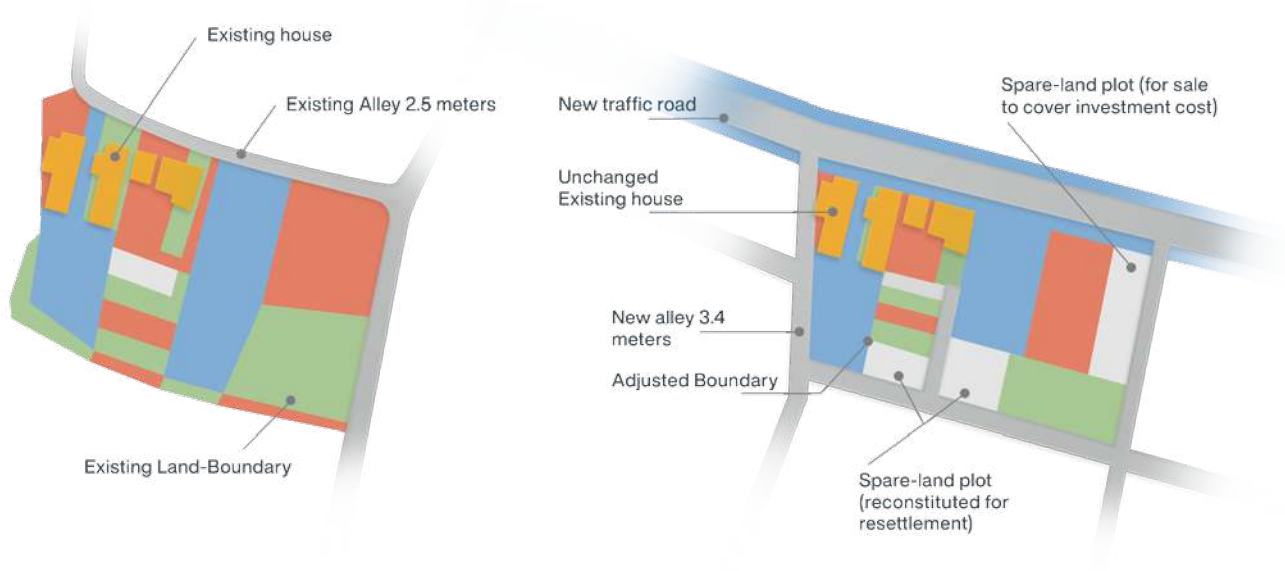
of the affected households needed to agree, more than 90 per cent agreed to participate by 2017. The project was estimated to increase the value of the developed land by 3.5–5 times, and data show that affected land values have tripled since the urban upgrading project got under way. Contributions from households can be made in the form of cash, land, or a combination of both. After completion of the project, parcels returned to participating households will be at their original location.

As the first land pooling project in Viet Nam, the absence of a legal framework presented a major challenge. The project backers addressed this challenge by defining best-suited approaches, including a standard land record-keeping format, increasing capacity for the project management team and drafting land decrees. The second challenge was in obtaining agreement from households and communities. A community working group was established at the beginning of the project that included representatives from the community, city government and local organizations which assisted the project management team in consultation and communication with households. The third challenge was the lack of funding sources for infrastructure construction. While it was potentially possible to attract

²⁴ This case study is a summary of information based on studies conducted by the World Bank, 2018b; and Chen and Pham, 2017.

²⁵ Other recommended case studies include the riverfront project in Pune, India (Betterment Levies); the sewerage programme in Bonifacio Global City, Metro Manila (Leveraging Publicly Owned Land); the metro rail project in New Delhi (Land Pooling); and the urban infrastructure improvement project in Bhutan (Land Pooling).

Figure 11
Part of the land pooling project in Ward 7, Tra Vinh, Viet Nam



Before land pooling and readjustment implementation

After deploying land pooling and readjustment

Source: Nguyen and others, 2018.

private funding by providing land as a return on investment, removing associated bureaucratic and administrative roadblocks would have been necessary to avoid significantly delaying the project.

Naya Bazar Land Pooling Project in Nepal

Land pooling and readjustment is considered a highly applicable scheme for Nepal where the Government has little control over private land and informal settlements, and the majority of the population live below the poverty line with minimal capability to improve urban infrastructure services either directly or via local tax contributions to the local government.

The Naya Bazar land pooling project²⁶ involved collaboration between different levels of government and international organizations, such as the Asian Development Bank. Among the actors involved, Kathmandu's Municipality Infrastructure Improvement Project was the main implementation body chaired by the mayor of Kathmandu Municipality City (KMC). There was also a user's committee, which represented the interest of all landowners and tenants in the project area. The project covered areas in two wards in KMC. Approximately 95 per cent of the land was privately owned by farmers. At project completion, road infrastructure covered 21.5 per cent of the area, compared with the previous 1.6 per cent.

²⁶ This case is a summary of information based on ADB, 2017b; and Pradhan, 2017.



A key challenge was that most of the people living in the project area were illiterate, and it took more than 18 months to simply explain the land pooling concept. It is therefore worth considering launching public awareness programmes before project initiation to educate the public about the merits of land pooling projects.

Congestion-charging and environmental user fees

Urbanization brings with it negative externalities, such as traffic congestion, water pollution, deforestation and air pollution. While environmental taxes can potentially play a large part in facilitating green and sustainable urban development, they are typically applied as a national policy and rarely practiced at the municipal level. Congestion-charging and environmental user fees, on the other hand, are usually locally designed and implemented policies that can simultaneously target environmental problems.

Both congestion-charging and environmental user fees can be used as incentives to reduce negative externalities, improve health and quality of life, provided they offer options for low income passengers. Congestion-charging schemes that feature sound technical design, enjoy solid political support and work hard to engender broad public acceptance can be a tool that enables cities to simultaneously tackle traffic congestion and high levels of pollution. Environmental user fees, on the other hand, encourage firms and households to take environmental responsibility and exercise self-regulation. These schemes can also potentially raise significant revenues, which may be used to improve the lives of users, and will likely further engender support for these initiatives.

Singapore's electronic road pricing

The Electronic Road Pricing system²⁷ was designed by the Land Transport Authority of Singapore to address the drawbacks of the


²⁷ This case study is a summary of information based on research conducted by Bhatt and Higgins, 2008; ADB and GIZ, 2015; Menon and Guttikunda, 2010, and Wilson, 2017; as well as information extracted from Singapore's Land Transport Authority website.

"Congestion-charging and environmental user fees are usually locally designed and implemented policies that can simultaneously target environmental problems."

existing, paper-based license scheme that controlled entry into a restricted zone around the central business district. The system charges vehicles per entry into the restricted zone. However, it is worth noting that Singapore is replacing its gantry-based infrastructure with a

more sophisticated, smartphone-sized onboard system using satellite data. The new system, which is expected to be rolled out in 2020, will be able to cover the entire island and levy charges according to the distance travelled, resulting in a full-scale road-pricing scheme.

Table 5
Categories of passenger car unit

Passenger car unit (PCU)	Vehicle type
0.5	 Motorcycles
1	 Cars, taxis and light goods vehicles
1.5	 Heavy goods vehicles and small buses
2	 Very heavy goods vehicles and big buses

Source: Singaporean Land Transport Authority. Available at www.lta.gov.sg/content/ltaweb/en/roads-and-motoring/managing-traffic-and-congestion/electronic-road-pricing-erp.html.



An in-vehicle unit uses satellite data to levy charges in the central business district of Singapore. Photo from Lewis Lehe (2017). A history of downtown road pricing. Available at <https://medium.com/@lewislehe/a-history-of-downtown-road-pricing-c7fca0ce0c03>. Accessed on 5 July 2018.



The system operates from 7 a.m. to 8 p.m. The charges range from zero to S\$2.00 per entry and vary by location, time of day and vehicle type. Charges are also adjusted quarterly by the Land Transport Authority in an attempt to keep driving speeds within pre-defined ranges (45-65 kph on expressways and 20-30 kph on other roads). The system cost S\$197 million (\$145 million) to develop, including S\$100 million for the in-vehicle units as well as S\$97 million for the gantries and the computing system. The annual operating cost is estimated to amount to approximately 20-30 per cent of revenues.

This case study indicates that an effective urban road pricing system needs to be designed to fit local traffic conditions and combined with other policy tools, such as vehicle entitlement fees and taxation. The physical infrastructure needs to be planned and exhaustively tested before being fully implemented. Concerns over citizen privacy need to be addressed: the system applies its charges to anonymously purchased cash cards

and only records a vehicle's license plate in the event of payment failure. Finally, the Government needs to exert a major effort in educating the public concerning the reasoning behind and the benefits of the scheme. Information about the system was communicated to the public presenting it as a necessary measure to help ensure long-term economic growth and maintain the quality of life of Singaporeans. Through this pre-policy education campaign, the Government was able to adjust the policy in response to public reaction before implementation of the system.

Environmental charging in Laguna Lake, the Philippines

Considered to be the first of its kind in the Philippines, the Environmental Users Fee System²⁸ is a market instrument used by the Laguna Lake Development Authority since 1997 to reduce industrial water pollution. It encourages companies via a "polluter pays principle" to invest

²⁸ This case study is a summary of information based on research conducted by Ancog and others, 2008; Briones, 2006; and Mercado, 2008, as well as information from Laguna Lake Development Authority's website (<http://gwhs-stg03.i.gov.ph/~s3lldagov/index.php/environmental-users-fee-system-eufs/>) and (<http://llda.gov.ph/wp-content/uploads/dox/br/euf/br33s1996.pdf>).



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"As with all community-based schemes, it is critical that a strong, respected and therefore effective governance regime be installed to help ensure that financing mechanism rules are properly adhered to."

and operate water pollution prevention and/or abatement systems within their establishment. The system covers all enterprises within the administrative jurisdiction of the Development Authority that discharge wastewater into the Laguna de Bay system. These include commercial/industrial establishments; agribased industries/establishments, such as swine farms and slaughterhouses; clustered dwellings (i.e. residential subdivisions); and domestic households.

Under the system, an enterprise is required to obtain a discharge permit, renewable annually, from the Laguna Lakes Development Authority. The permit costs 1,150 pesos (about \$22), adjustable every year, and is a legal authorization for the enterprise to discharge wastewater into the tributary rivers within the Laguna de Bay region. Permits are issued by the Development Authority only if the wastewater being discharged complies with the effluent standards set by the Government.

The system consists of a fixed and a variable fee. The fixed fee covers the administrative cost to implement the system and is based on the volume of wastewater that is discharged. The variable fee is calculated with reference to the biological oxygen demand (BOD) loading as well as to the volume and concentration of the wastewater being discharged. Since the implementation of the system in 1997, the Development Authority observed a reduction in industrial BOD loading, yet it also encountered a host of problems and issues, including insufficient coverage, inefficient fee collection and a failure to plough fees back into the industries and the communities. As with all community-based schemes, it is critical that a strong, respected and therefore effective governance regime be installed to help ensure that financing mechanism rules are properly adhered to.



4.3 Future policy pathways for urban finance

This chapter proposes three financing mechanisms for sustainable urban development:

Encourage technology firms to become more civic minded and create sustainable smart city solutions with social enterprises

Adopt cybersecurity safeguards in both digital and physical urban infrastructure development planning

Develop smart mobility investment plans that prioritize sustainable urban mobility options for citizens

Expand viable smart city funding mechanisms by enabling cross-sector sustainable partnerships and business matching platforms

Scale up public-private partnerships and community schemes to transition to localized housing finance solutions

Adopt land-linked financing mechanisms that leverage urban growth to build people-centred urban infrastructure

Introduce congestion-charging and environmental user fees to improve urban air quality

"A common theme underlying the successful implementation of all three of the financing mechanisms presented here is the need to put into place a robust legal and policy framework."

A common theme underlying the successful implementation of all three of the financing mechanisms presented here is the need to put into place a robust legal and policy framework, which provides three tangible benefits.

First, it helps ensure the legitimacy of the proposed financing schemes and projects, including, importantly, authorization from higher levels of government, such as national legislation. Second, such a framework often ideally translates into the creation of a dedicated public authority that is concentrated on managing, implementing and monitoring the chosen schemes and projects. Third, a sound legal and policy framework helps secure participants' rights. If in place, such a framework can facilitate the implementation of the three future policy pathways for urban finance proposed here.

. 1

Scale up public-private partnerships and community schemes to transition to localized housing finance solutions

Housing development solutions are typically nationally led, large-scale programmes, although these assets are often later managed or maintained by local authorities. However, with large-scale national funding being increasingly scarce, it is becoming more important for local authorities themselves to design and implement housing solutions. Of course, local authorities also face credit limitations but as the scale of development – particularly for lower-income housing – at the local level is relatively smaller, local housing finance solutions can prove to

be practical, particularly where the public and private sector combine to develop and maintain the assets.

Successful housing finance requires more than simply an influx of capital. Municipalities need legal and policy frameworks that allow capital to be invested in the construction and maintenance of housing for targeted populations with a fair and equitable system for determining who is provided access to new housing and under what tenure conditions, namely rental or homeownership, and subsidized in what format, such as a percentage of salary.

Public-private partnerships. Adopting a PPP model in affordable housing projects potentially conveys a number of benefits for municipal governments. Better usage of the private sector's resources and expertise during project design and construction can relieve the financial distress caused by a Government facing cashflow problems from taking on debt, as well as better anticipation and balancing of housing demand and supply (Liu, Chan, and Wang, 2014). Successful affordable housing PPP programmes have been documented in developed countries, such as the United Kingdom, and middle-income countries, such as India (UN-Habitat, 2011).

Among different models of PPP, allowing a developer to build on government land is one of the more feasible approaches for municipalities in developing Asia-Pacific countries to adopt. In this approach, the Government provides the land while the private sector is responsible for housing design and construction.



*Community schemes.*²⁹ Successful municipal-level PPPs require strong and capable institutional support. The establishment of a housing board or a similar authority that is willing to dedicate time and effort to housing projects is crucial. In a community-based scheme, for example, the housing board's tasks also include conducting background investigations of contracting authorities and their household members, loan application examination and implementation monitoring (e.g. to ensure that the contracting authorities and households respect environmental regulations in the case of self-built housing construction). There is also a need for commitment and capacity from both the public and private sectors throughout the PPP cycle, encompassing feasibility study preparation, contract negotiation and operation monitoring. Of particular importance is for the public sector to lend its support for the land acquisition and transaction process, which entails identification of stakeholders' interests, agreements on sale and compensation, and land registration for smooth PPP implementation (Sengupta, 2006).

There needs to be a viable financial implementation structure. For housing PPP projects, the special purpose vehicle needs to have sufficient financial depth (i.e. an appropriate combination of equity, primary debt and subordinated loans). For community-based schemes, the authority should consider providing low-cost mortgages or zero down payment deals for the dwellers. Meanwhile, the local authority should ensure that the selected private partner is properly qualified to deliver

the required housing assets so as to minimize possible economic, financial and technical risks. In the experience of Kolkata in India, the chosen private sectors were "large, reputable indigenous business groups with established financial credentials" (Sengupta, 2006).

An enabling regulatory and policy framework should be put into place to support PPP projects. This framework includes authorization from higher levels government typically translating into national legislative support, such as in relation to contract enforcement regulations (UN-Habitat, 2016) and land acquisition laws (Sengupta, 2006). For housing projects in particular, municipal governments should also consider looking for policy support, such as subsidies or cross-subsidization with the private sector, to reduce the overall costs for private counterparts to keep developed housing costs at affordable levels.³⁰ Meanwhile, the local authority should also consider introducing rent control and quality requirement codes to better deliver good-quality affordable housing for its residents.

- 2

Adopt land-linked financing mechanisms that leverage urban growth to build people-centred urban infrastructure

Land pooling is an incentive-based and self-financing form of land value capture. It usually involves private landowners voluntarily contributing some portion of their land for public infrastructure development. In return, each landowner receives a smaller area of

²⁹ Community schemes can be applied to many other forms of urban infrastructure development, such as utility services (water, wastewater and solid waste), schools and health facilities.

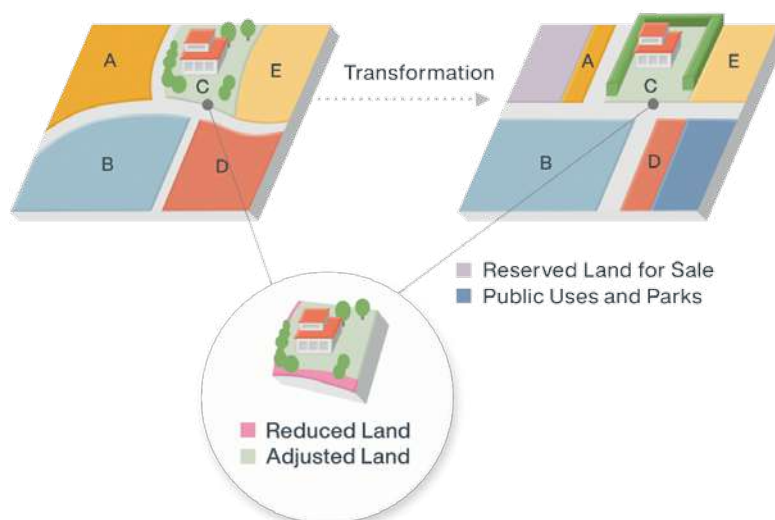
³⁰ A government subsidy might not be entirely applicable for municipal governments in developing countries.

"Land pooling is an innovative method that can minimize displacement and land expropriation, mitigate project costs and encourage citizen participation in policy decision-making."

land, but a portion, the value of which has appreciated due to the new infrastructure that has been developed at the site. In similar fashion, Governments can exchange land rights with the private sector in exchange for lower-cost or free construction services. Land pooling is an innovative method that can minimize displacement and land expropriation, mitigate project costs and encourage citizen participation in policy decision-making (World Bank, 2018b). In the figure below, contributed land has been redesigned for infrastructure and public space, while households (area C) remain in their original neighbourhood.

In order to capture and make use of the value of the land, the Government first needs to identify land titles. This is a critical and usually quite difficult step for the Government to undertake. The Government also needs to produce a full project feasibility study that encompasses project design and financing options as well as other forms of due diligence (e.g. environmental and resettlement impacts), carry out land valuation, conduct public consultation and finalize other preparation elements. It is recommended that the Government establish a separate, dedicated agency to manage these processes.

Figure 12
Conceptualization of land readjustment



Source: Nguyen and others, 2018.



The second step entails negotiation with landowners. The agency needs to be clear on land contribution rules: What percentage do landowners contribute? In what form, land or cash (in case some do not have enough land)? How much will be returned after project completion? What is the compensation for those who refuse to participate? After the majority of landowners agree with the scheme, as defined in the design phase, the Government can move on to the next step.

To ensure successful implementation, land pooling requires the following enabling factors:

- As previously discussed, a sound legal framework that supports land pooling to ensure the legitimacy of the project and to secure landowners' property rights
- Appropriate land registration and cadastre map system for land title identification and valuation
- A public body that is willing to handle the funding process; this requires political support from municipal and higher-level authorities
- Consent from the majority of landowners, as land pooling and readjustment is a voluntary process and hence requires majority agreement from the community to minimize adverse effects, such as displacement
- A site development plan to ensure that the project is aligned with the city's overall master development plan

One of the tool's major challenges is the difficulty in obtaining consensus from landowners. This requires the municipal government to have strong capacity in project management, particularly in relation to negotiation.

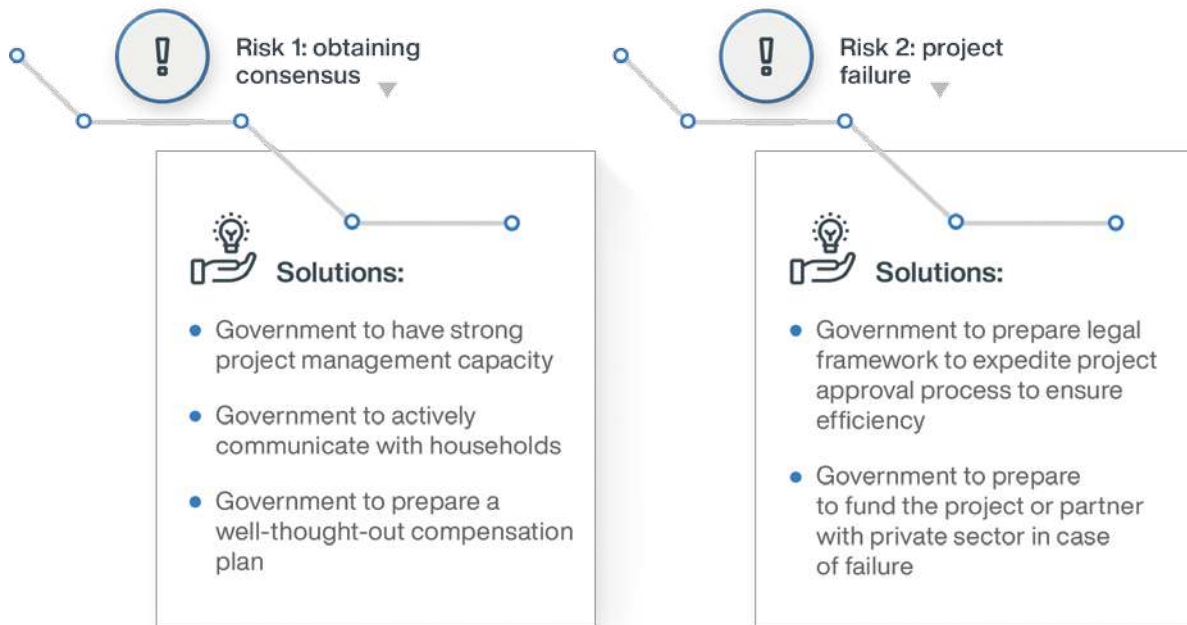
The municipality should also be prepared in case of project failure. One way to prevent this possibility is to have a legal framework that ensures timely project approval. This measure ensures that the project will not take too long and require re-evaluation of land value. The Government should also be prepared to inject public funding into land pooling and readjustment projects as an incentive for landowners as well as a precaution in case there are difficulties in achieving self-financing (see figure 13).

. 3

Introduce congestion-charging and environmental user fees to improve urban air quality

Urban road pricing schemes impose charges on vehicles entering into a specific urban zone, such as a central business district. Such charges can be made on a per entry basis or across longer periods, although typically no more than a single day. Such schemes are not principally designed to generate revenue for Governments, although revenue raised can be a useful by-product that builds citizen support if the revenue is clearly allocated to improving the environment or to funding alternative modes of transport. Rather, they are designed to influence car-dependent behaviour by shifting travel by time, mode and

Figure 13
Risks and solutions associated with land pooling and readjustment



route, as well as reducing overall travel demand. Only a few cities in the world have adopted this scheme. In the Asia-Pacific region, Tehran and Singapore have congestion pricing. Outside the region, Dubai, Stockholm and Gothenburg, London and Milan all maintain congestion charges (Lehe, 2017).

During implementation, the Government's role will include technology procurement, installation, testing, hiring and training of personnel, as well as communicating to the public how to use the system. After the charging system has been implemented, the Government needs to monitor daily operations and carry out system maintenance as well as conduct regular evaluation of scheme effectiveness and make adjustments as necessary.

A successful charging system requires a robust local legal and institutional basis to support and

enforce the system (see table 6). Cities need to clarify whether they have the right to levy charges in relation to a road that may not have been funded by the municipality and whether they have the right to apply detection, identification and registration systems in relation to privately owned vehicles. It is also important for cities to clarify whether they are able to enact their own local laws to enable implementation or they are reliant on the state or national legislative system.

A clear understanding of the local traffic and transport situation is needed during the preparation and feasibility stage as it affects the design of a sensible policy. Are there measurable levels of congestion and/or environmental outputs? Will a significantly large proportion of car owners be included in the scheme and be charged? What will be the anticipated impact of the scheme? Are suitable alternative transport modes available and of sufficient capacity?

Table 6
Process of designing a system for applying charges to vehicles using certain areas

Feasibility study	<ul style="list-style-type: none"> • Identify opportunities and barriers, including the need for a legal and political basis • Understand that the traffic situation (e.g. modal split in different areas, parking capacity, where the traffic exists) of the city has to match a better charging model (e.g. London uses daily-entry-based charging as it has a clear inner city ring area)
Functional design	<ul style="list-style-type: none"> • Define where, when, whom, and how much to charge through a comprehensive study of different alternatives
Technical design	<ul style="list-style-type: none"> • Develop the charging system (how the vehicles will be detected, how the system will be enforced), the control centre, and a customer service centre
Institutional and legal design	<ul style="list-style-type: none"> • Design a regulatory system (e.g. vehicle registration, license plate database) according to the gaps identified by the feasibility study to support the charging system • Identify policy windows to roll out the system (e.g. avoid election time)
Communication plan	<ul style="list-style-type: none"> • Design a strategy to communicate and educate the public and stakeholders about the system and its benefits to gain support, as well as to prepare for potential public criticism

Source: Adapted from ADB and GIZ, 2015.

Third, municipal governments in developing countries seeking to enact road pricing must reconcile their local priorities with national policies to promote domestic consumption and industrial growth. For example, some countries heavily subsidize their domestic car industry, which would constitute a conflicting agenda with any effort to reduce car use. If examined as a component of the overall fiscal policy package in a country, a congestion tax could be a costly policy measure with little ultimate impact when the public sector continues to call for incentives for more cars. Consequently, alternative policies, such as phasing out some subsidies and incentives, should also be part of any strategy to reduce automobile congestion in developing countries.

Finally, the policy will require public acceptance in the long term. This is one of the major challenges in introducing congestion charging policies. Failing to gain support from citizens might lead to political unrest. The evidence to date from cities that have implemented urban road pricing schemes is that concerns and opposition have been expressed during pre-project public survey process, but opinion has shifted towards supporting the scheme after the policy was implemented and its results were proven.

Conclusion

This chapter proposes that local governments – and particularly intermediary cities – consider utilizing (and adapting to their unique circumstances) three specific financing options and, in combination with traditional financing schemes, use these to help meet their infrastructure development needs. In order to achieve this objective, it is recommended that municipal governments:

- a. Construct a sound legal system and policy framework as these form the foundation of a solid financial structure. As stated in multiple places in this chapter, this foundation is not just to ensure the legitimacy and implementation of the government’s work, but also to protect the rights of local people and gain trust from the public. It is also essential to make sure that local regulations and policies are in line with the regional and national frameworks;
- b. Consider taking steps – such as establishing strong intergovernmental relations – to support fiscal decentralization initiatives. Decentralized fiscal autonomy can provide cities with the opportunity to raise their own revenues as well as greater responsibility not just for delivering local goods and services, but also for constructing transparent municipal financial management systems, such as open budgeting and expenditure information-sharing;
- c. Learn from best practices. While this chapter has been devoted to finding “common (financing) solutions to common urban problems”, it is still important to keep in mind that there is no “one size fits all” when it comes to a local government seeking to finance its infrastructure and utility service needs. That said, governments can still learn from the kinds of experience presented in this chapter.

The road forward to finance the future Asia-Pacific city is challenging but not impossible. Better preparing cities to help finance themselves in a feasible way should be the goal of all national Governments given current trends in urbanization and development. It is the goal of this chapter that policymakers be able to take away some understanding of what has been applied elsewhere and seek to utilize similar mechanisms in their cities.

As a final note, it is worth considering how progress may be measured in relation to municipalities’ ability to finance themselves. Metrics can indicate the degree to which local governments are becoming more financially autonomous, such as the share of national government transfers as a percentage of total municipal receipts; the share of own-source funding, including fees, tariffs and local property taxes as a percentage of total municipal receipts; and measurement of diversity in debt funding options utilized by municipalities. National and local governments could report on progress in relation to such key performance indicators and set targets for achieving financial autonomy goals. Given the Addis Ababa Action Agenda resolution to strengthen local initiatives with respect to the financing of basic public goods, it would be useful for development partners to assist national and city governments with the identification of a core basic agenda that improves leverage of capital and promotes scale and sustainability. The time for linking municipal demands with domestic finance has come.





DEVELOPMENT PATHWAYS FOR A SUSTAINABLE URBAN FUTURE

**The Future
of Asian
& Pacific Cities**

DEVELOPMENT PATHWAYS FOR A SUSTAINABLE URBAN FUTURE

An Asia-Pacific mayor faces a dire forecast of a cyclone set to make landfall in her city. Per the city's resilience strategy, the local government established a central operations centre with monitoring and communication capacity to reach citizens in the event of an emergency. Fortunately, most of the low-lying areas that historically flooded in the event of cyclones were rezoned following the city's last comprehensive plan, and they are not densely settled. One coastal area is a concern, however. Years ago, a private real estate developer wanted to construct a residential complex near a popular beach. After much negotiation, the developer agreed to setbacks as established by the city from the high-tide mark projected for 2100 in an effort to future-proof ahead of sea level rise. Still, the risk of near-term flooding was great enough that the city opted to build a seawall in some areas and plant a natural defence barrier of water-absorbing mangrove in other areas. To pay for this expensive infrastructure investment, the city initiated a value capture scheme and charged the owners of the beachfront property, who saw their property values increase once the coastal protections were completed, as the design also included new waterfront public space.

This hypothetical story weaves together the four elements reviewed here – urban and territorial planning, urban resilience, smart and inclusive cities, and urban finance – in the face of the report's four overarching challenges: natural resource management; climate change; disaster risk; and inequalities. While natural disasters are a

dramatic and easily visualized scenario for which local leaders must prepare, the complexities of the modern city involve a host of other challenges for which this report's future policy pathways offer interlocking solutions.





 The future of urban & territorial planning
 The future of urban resilience
 The future of smart & inclusive cities
 The future of urban finance

Integrate sustainability and quality-of-life targets into urban planning to future-proof public and private investment in cities

Co-produce with citizens urban planning solutions that align technological investment with adequate local government capacities

Identify specific urban regeneration and growth strategies that optimize urban-rural and city-region collaborations that spur sustainability and investment

Scale up the use of nature-based solutions and resilient infrastructure in integrated urban and climate change planning

Understand the informal economy and support urban poor groups to be change agents for implementing city resilience actions

Create and strengthen partnerships to bring more attention and resources to long-term urban resilience strategies that break siloes between national, state and local actors

Utilize big data sources to connect communities, cities and regions and to improve local government technological literacy

Improve smart city governance across urban systems, institutions and actors to overcome inequalities and make more informed and integrated planning decisions

Encourage technology firms to become more civic minded and create sustainable smart city solutions with social enterprises

Adopt cybersecurity safeguards in both digital and physical urban infrastructure development planning

Develop smart mobility investment plans that prioritize sustainable urban mobility options for citizens

Expand viable smart city funding mechanisms by enabling cross-sector sustainable partnerships and business matching platforms

Scale up public-private partnerships and community schemes to transition to localized housing finance solutions

Adopt land-linked financing mechanisms that leverage urban growth to build people-centred urban infrastructure

Introduce congestion-charging and environmental user fees to improve urban air quality

"A sustainable future occurs when planning lays a foundation; resilience guards against future risk; smart cities deploy the best technology for the job; and financing tools help pay for it all."

The cities of 2030, 2050 and 2100 will be very different from today. They will be cities transformed: in their demographic composition, in their implementation of technology and in their wider ecological contexts. The challenges of building cities sustainable enough to meet the changing needs of the future will require new ways of thinking and working, as well as new kinds of multi-stakeholder initiatives and partnerships. Learning to ask new and better questions, and building new approaches to tackling old problems, will be the role of any stakeholder, private or public, looking to be part of solutions to these challenges.

As presented here, the report makes the case for four priorities and four approaches to realize a sustainable urban future in Asia and the Pacific. A sustainable future occurs when planning lays a foundation; resilience guards against future risk; smart cities deploy the best technology for the job; and financing tools help pay for it all. Getting these essentials right in cities today is vital in order to adapt to the demands of tomorrow.

Technology is crucial for connecting people and disparate urban systems, but technology alone cannot solve the social, environmental and economic issues that growing cities face. The future is in the hands of those Governments, civil society actors and entrepreneurs who will work together to create citizen-centric, sustainable cities.

Urban and territorial planning is the bedrock of the sustainable future city. At whatever stage of

a city's development, whether an entirely new urban extension or a city with ancient roots, a single-plan vision is essential to create an agreed road map for a city's future growth or shrinkage. National planning practices and statutes vary widely, but the International Guidelines on Urban and Territorial Planning³¹ offer a template for basic planning principles. Thoughtful planning has been key for the Asian and Pacific cities that rank among indices of the world's most liveable, sustainable and economically successful cities. The city planners of the future will need to make sure that the cities they design can withstand what the world throws at them, particularly when it comes to environmental challenges, by integrating sustainability and quality of life into their spatial plans, visions and strategies. Aided by new forms of planning technologies, they will need to co-produce solutions with citizens to promote urban growth and regeneration and optimize urban-rural and city-region collaborations.

In a world of increasing climate change threats, however, planning must serve more than just charting needs against future population growth or decline. Urban resilience is the next principle that must be layered atop planning in order to ensure the future prosperity of Asia-Pacific cities. The resilient cities of the future will need to be effective at breaking down siloes among entrenched city government departments by encouraging collaboration to address transversal challenges, such as economic downturns, migration crises and natural disasters. Cities will need to do this while employing nature-based

³¹ Produced by UN-Habitat, these are available at www.uclg.org/sites/default/files/ig-utp_english.pdf.

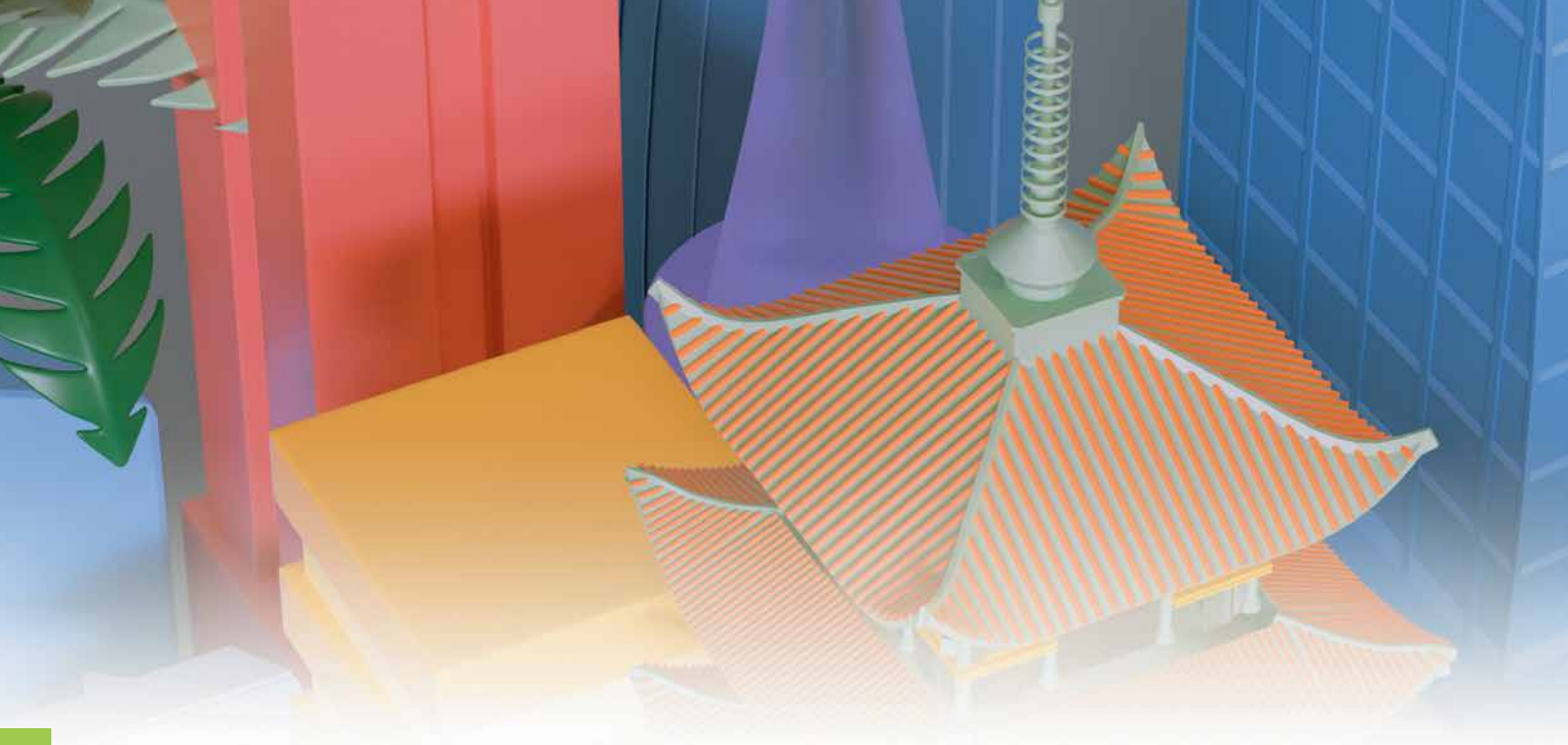


infrastructure solutions and the dynamism of the informal economy as particularly potent tools to create sustainable and resilient outcomes for all.

In turn, technology has become an irreplaceable component of 21st century lifestyles, one that extends to city management. So-called smart cities that rely on advanced technology now have endlessly customizable tools at their disposal to monitor and model nearly every aspect of urban life. Such technology can be empowering, but also paralysing. Clear regulations and cybersecurity policies are essential to managing the digital future of urban policymaking. Such regulations can also temper the potential data collection excesses of such tools by enshrining privacy rights that build trust with everyday citizens. The smart cities of the future support infrastructure and innovative technology with governance and security systems to improve the quality of life of citizens and enhance their interactions with the urban environment while protecting everyone's safety. Becoming a smart city is not a goal but a means towards achieving sustainability. To respond more effectively and dynamically to the needs and desires of

residents, technology is simply a tool to optimize the infrastructure, resources and spaces that people share. Future smart cities need to focus on improving outcomes for residents and harness the creativity of the technology sector in shaping the integration between the physical and digital environment in the Asia-Pacific region.

Ultimately a vision for a well-planned, resilient and sustainable city that employs inclusive technology will not be realized without a means to pay for everything ranging from robust planning capacity to resilient infrastructure to smart city toolkits. Urban finance is the lynchpin that ties together the previous three components of sustainable cities. The world of municipal finance is vast and complex, but there are concrete areas, such as land-linked financing and pollution pricing, where cities can seize the fiscal reins in order to achieve discrete objectives. Innovative urban finance has been pursued by cities of all sizes, even smaller towns, showing that urban financing options are available to all types of local governments. The sustainable cities of the future will employ more creative financing solutions needed for infrastructure improvement



projects. With costs increasingly too great for one company – or even one government – to afford alone, and with projects increasingly dependent on other, related work, cross-sector collaboration and coordination is becoming the norm. Building the right networks – through PPPs or community finance initiatives – learning how to measure risk and returns, and making the right funding available to achieve sustainable outcomes, will be critical to help these cities improve their operations.

However, how can these four broad themes be turned into action? This report has distilled the common solutions to common problems facing Asian and Pacific cities, enumerating critical policy pathways that are essential to ensure a better urban future. Not all local leaders will find that all policy pathways are appropriate to their context, but some pathways will be. Figuring out which combination of pathways is the right mix for a given city will be the task of local authorities in collaboration with national authorities, the private sector, stakeholders and everyday urban citizens, as they seek to apply the lessons drawn from this report. How to elicit the right combination and the priority with which to pursue them? That is a question only a city itself can answer through analysis and self-reflection of its strengths, weaknesses, vulnerabilities and resources.

The future of Asian and Pacific cities need not be destined to rapid and unplanned urbanization, congestion, resource depletion, ever-rising consumption patterns and emissions, polluted air and waterways, and rising inequalities. Adopting the policy pathways identified in this report will enable the region's cities to not only overcome these existing realities but also to set future development patterns that will assure sustainable urban development for decades to come while meeting the needs of growing urban populations.

To realize the future vision of inclusive, safe, resilient and sustainable cities will require focused efforts on the thematic priorities in this report. The approaches to which all urban stakeholders must contribute are clear:



1. *Plan the foundations of a sustainable future.* All cities must strengthen their capacities, adopt inclusive planning processes and develop long-term spatial and investment plans that effectively consider urban growth, quality-of-life goals, resource implications and smart approaches.



2. *Guard against future risks.* To ensure sustainable growth and development, it is critical that cities

"This report endeavours to cut through the noise of sustainable urban development and focus on the four major areas that cities must get right if they wish to deliver on the Sustainable Development Goals and the New Urban Agenda in the coming decade."

adopt resilience strategies that break down governance siloes to improve policy efficacy, provide opportunities to scale up nature-based infrastructure solutions, and engage the creativity of the urban poor as solution providers to guard against potential shocks and stresses, including natural disasters.



3. *Capitalize on frontier technologies to develop people-centred smart cities.* City leaders must develop smart cities road maps across different urban systems that capture the innovation of technological entrepreneurs, bridge the digital divide, support smart mobility and include the perspectives of local stakeholders, while ensuring their safety.



4. *Mobilize financing to invest in sustainable urban solutions.* Local governments must access or adopt innovative investment tools, such as land value capture instruments, PPPs and environmental user fee models. These can serve as important levers to catalyse economically impactful capital investments that create long-term value for citizens, businesses and the city as a whole.

In this context, the report can be used to launch a dialogue in the city. If there are no mechanisms for stakeholders to come together and discuss the local urban future, one should be created, such as a local urban forum, an online platform to discuss sustainability pathways for their city or a media campaign that promotes civic conversation. No city will fare well with a top-down, go-it-alone approach. To that end, this report will serve as a vital road map to the next decade of urbanization in Asia and the Pacific, from booming intermediate cities to ageing legacy cities, and serve as a reference of how to shape urbanization while heading into the crucial 2020-2030 window.

The depth of these concepts can at first appear overwhelming in their scope, but this report endeavours to cut through the noise of sustainable urban development and focus on the four major areas that cities must get right if they wish to deliver on the Sustainable Development Goals and the New Urban Agenda in the coming decade.

Wherever a city is on its progression, it is never too late to embark on the path to a sustainable city.

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The cities of 2030, 2050 and 2100 will be very different from today. They will be cities transformed: in their demographic composition, in their implementation of technology and in their wider ecological contexts. The challenges of building cities sustainable enough to meet the changing needs of the future will require new ways of thinking and working, as well as new kinds of multi-stakeholder initiatives and partnerships. *The Future of Asian and Pacific Cities* report 2019 makes the case for four priorities and four approaches to realize a sustainable urban future in Asia and the Pacific. A sustainable future occurs when urban and territorial planning lays a foundation; resilience guards against future risk; smart cities deploy the best technology for the job; and financing tools help pay for it all. Getting these essentials right in Asian and Pacific cities today is vital in order to adapt to the demands of tomorrow and to deliver on the 2030 Agenda for Sustainable Development and the New Urban Agenda.

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