
© Mark Benham

# CHAPTER 2

## The future of 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*

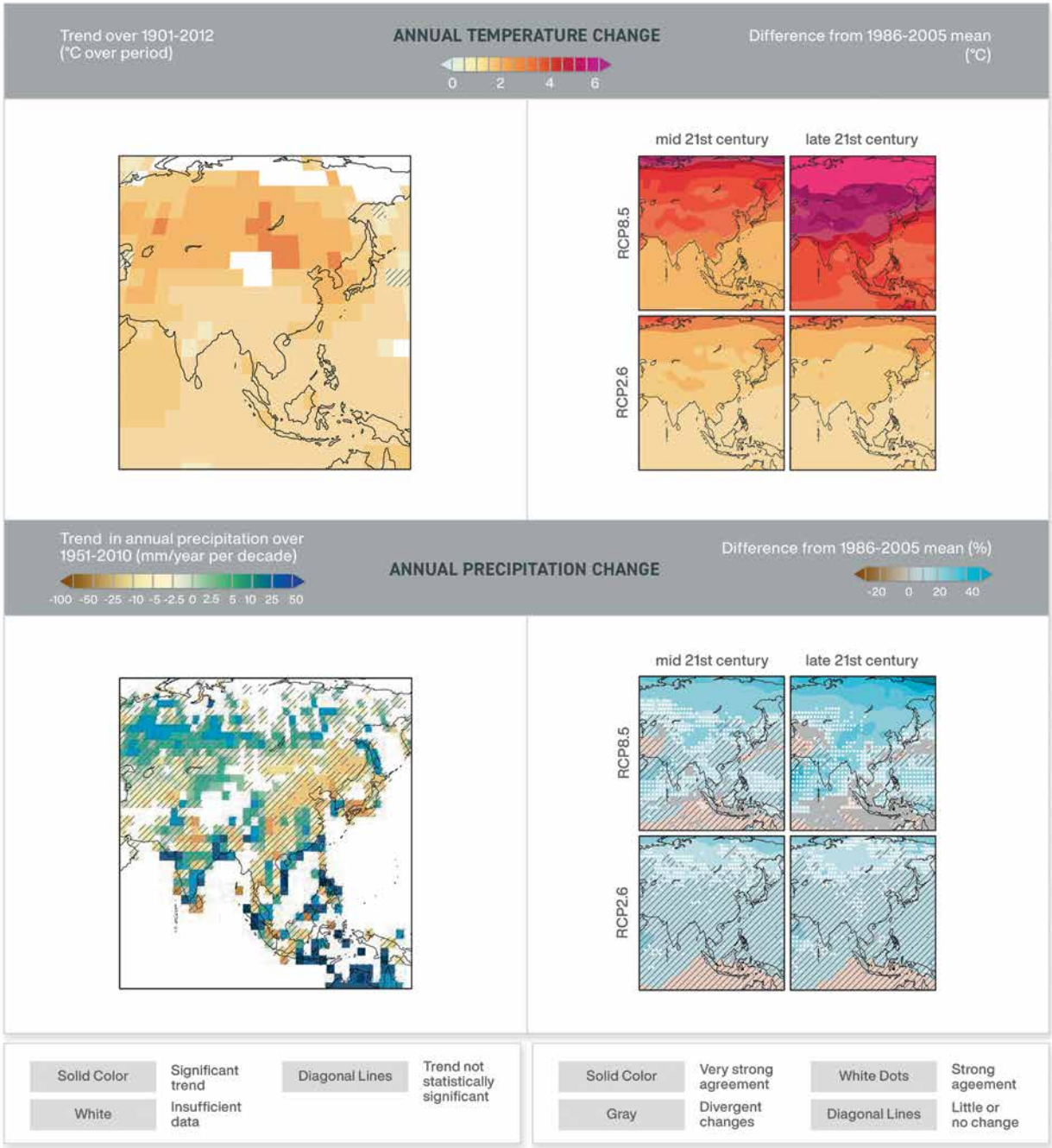
Climate modelling and economic forecasting suggest that more catastrophic events are on their way. Under current projections by the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (2019),[10] catastrophic ecosystem loss will disrupt food supplies; increasing heat and 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 6ºC 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."*

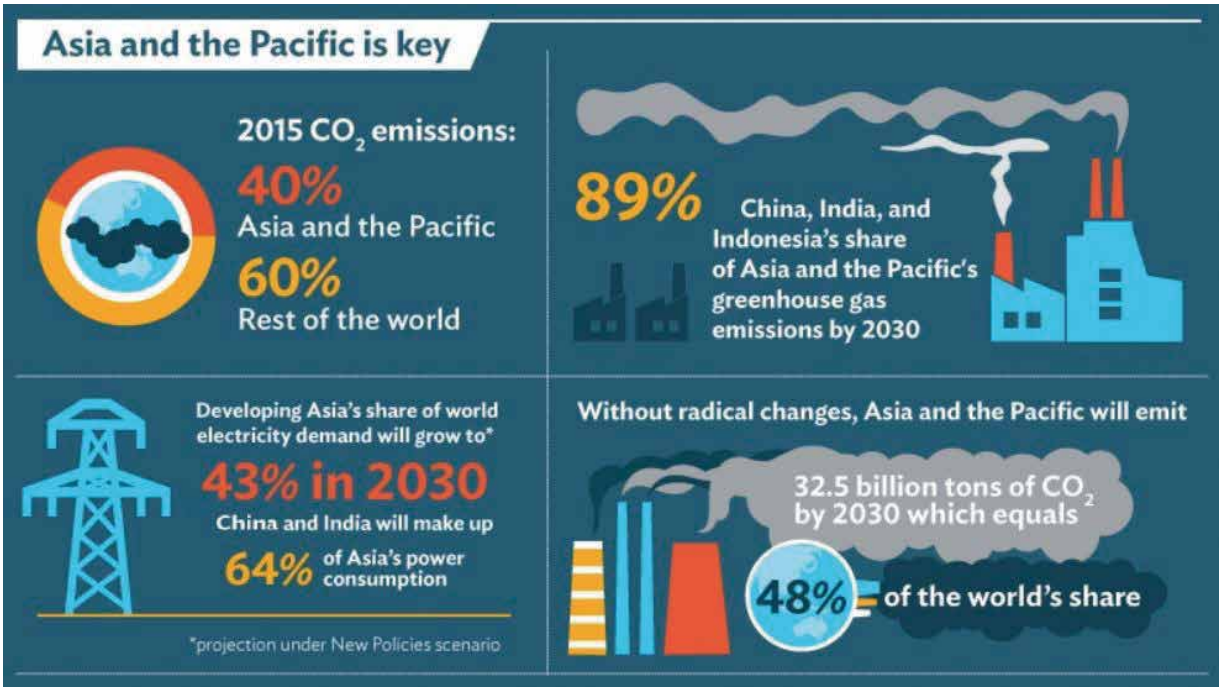
with stronger summertime warming over higher latitudes in Asia, where the temperature increase may reach up to 8ºC (ADB, 2017c). Extreme heat particularly affects people's ability to work outdoors. In India, for example, extreme heat results in 4-6 per cent less productivity per hour worked (UNDP, 2016). 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 37ºC 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 2ºC, 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).

© AJ Nakasone

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."*

© 24 Novembers

### *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."*

© Thanis

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."*

© Richard Whitcombe

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

© Sebastian Herrmann

. 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


Source: ESCAP, 2019b.

© Humphery

### *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 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



© Royalty Free

*"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.


## 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


### . 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

© Gokhan Susler

*"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.

© Augustine Bin Jumat

## . 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.


© Gokhan Susler

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".