

# INTRODUCTION

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Some of the most pressing urban challenges of our time are the unprecedented risks posed by climate change. Asian cities are among the most at risk globally, for the economic impact of extreme weather conditions and coastal flooding. The cities of Guangzhou, Mumbai, Shenzhen, Tianjin, Ho Chi Minh City, Kolkata, and Jakarta for instance, faced \$1520 million (USD) in annual losses in 2005 as a result of coastal flooding. And in case the effects will not be mitigated and global warming will continue unhampered, the economic losses for these cities are expected to rise to \$32,079 million by 2050 (Dulal 2019). Such risks are not restricted to coastal areas alone, as seen in recent years with the stormwater floods during Thailand's 2011 monsoon season, and the destruction and casualties as a result of super typhoon Haiyan or Yolanda in the Philippines in 2014, hitting in-land and urban areas as well.

## THE DARK SIDE OF ECONOMIC SUCCESS

Over the past decades, Asian countries have spurred tremendous economic growth and consequently made great steps forward in poverty alleviation. The unwanted side effects of this success, however, include increased consumption and waste production, rapid urbanisation and infrastructure development at the expense of valuable natural resources, causing ecosystem degradation, biodiversity loss and increased air pollution (Rajesh 2020).

China alone emits about 30% of the world's greenhouse gas emissions, mostly stemming from coal electricity generation and mining. As a consequence of the size of its economy and population, this has China ranked as the world's most polluting country, both on the production as well as the consumption side. In cities across the region, climate change causes extreme weather conditions, such as heavy rainfall or urban heat island effects. Pair that with the poor air quality, the nuisance of road congestion and degrading urban green spaces, and cities risk becoming less comfortable for people to live in.

## **CLIMATE CHANGE INCREASES INEQUALITY**

The wide array of risks posed by climate change are affecting the poor populations across the region disproportionately. According to a 2017 research paper by Julie Rozenberg and Stephane Hallegatte climate change is expected to push 13 million people in East Asia below the extreme poverty line. If not acted upon in a timely manner the recent developments of the region, in terms of economy, poverty alleviation and general well-being of the population will be counteracted by the effects of climate change. It is unequivocal that action is needed, and more countries and cities are waking up to the fact across the region. All Asian nations committed to the 2016 Paris Agreement, and are increasingly implementing strategies and policies to reduce greenhouse gas emissions and promote sustainable practices. But there is much to win in the coming decades.

## **CITIES HOLD THE KEY TO CLIMATE ACTION AND INNOVATION**

With more than half of the region's population living in cities, as centres for unsustainable production and consumption, this is where challenges accumulate. However, urban areas offer tremendous opportunities for innovation and experimentation with climate measures too. And because of their size and density, urban change has the potential to positively impact a large number of people at once. As the Paris Agreement emphasises, tackling climate change requires participation and collective action of a wide variety of stakeholders. Cities as hubs for inter-sectoral collaboration will, therefore, be crucial in sparking climate resilience. China, for instance, is quickly making its way as the world's largest producer of renewable energy and investing more and more in low carbon and climate-resilient cities and sustainable transportation.

The inspiring case studies in this section will illustrate that climate action in Asia today is multifaceted, and operates across a variety of scales and sectors. Each individual case study includes lessons for practitioners to be applied in the field. Together, however, they present a variety of urban strategies for improving the city at eye level, while boosting climate resiliency and creating more comfortable living conditions and economic opportunities for people living in cities. These strategies create win-win scenarios that substantiate investments to be made over the coming years.

- **Create more loveable cities by improving the climate resiliency of public space.**

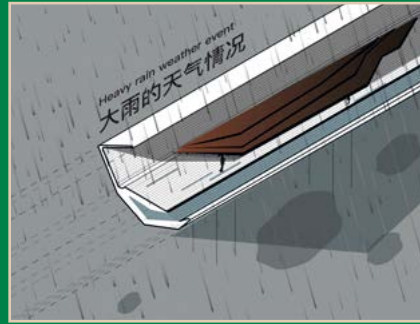
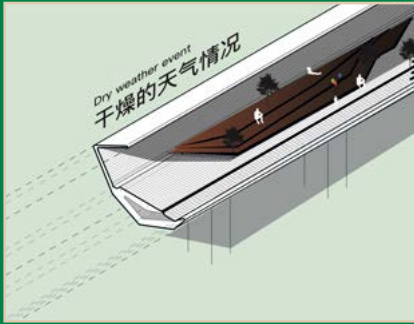
More walkable, bike-able, climate-resilient and green urban spaces shape the conditions for increased social interaction in communities and local economies to thrive. In the article 'Walkability in Asian Cities' Richard Lambert shows how cities across Asia are investing in attractive walking routes while reducing air pollution and boosting the inherent qualities of Asian cities, where streets are historically designated as places for social gatherings and informal business. Temporary car-free zones in cities like Hanoi and Ho Chi Minh make way for a weekly cultural festival where residents and tourists connect over board games, dance-offs, music performances, roller skating and street food. The pedestrianisation attracts new economic activity while at the same time offering cultural experiences and quality amenities for residents to enjoy.

Elsewhere, Yan Ling Lok illustrates that in densifying cities like Singapore it is wise to look beyond the immediate eye level and recognise the potential of greenery at 'skyrise level'. In the article 'Embracing greenery at various 'eye levels' across urban centres' she shows how Singapore has invested and incentivised an impressive 120 hectares of rooftop, edible and healing gardens as part of the built environment, helping to implement Singapore's City in a Garden vision. Besides creating loveable places for the local community, the vast urban green in the city has considerable impact on urban heat reduction, ever more welcome in the hot and humid climate of the region. A 2016 comparative study between Hong Kong, Singapore and Kuala Lumpur by Ardalan Aflaki and Mahsan Mirnezhad proves how urban greens can mitigate the Urban Heat Island effect and decrease global air temperature with as much as 4 degrees Celsius, making the city a much more pleasant place to reside in. And if climate action intersects with improving the quality of urban spaces for the city's users, and increases value on multiple levels, it becomes much more likely to tap into investments in the long run.

- **Increase participation and public support for the necessary change to come by facilitating climate action at eye level.**

To mitigate the effects of climate change in the coming years it will require considerable investments, of both monetary as well as behavioural change in society. Initiatives that promote climate action in public space make the change ahead tangible and experienceable, and at best fun and inspiring as well. Governments will not be able to face the challenge with top-down policy alone, and public support and participation will be crucial for the collective success of climate measures.

In 'Bicycle-Friendly Cities Through Public-Private Partnership' Manju George argues how through successful collaboration between multiple stakeholders, people in the city of Bangalore are gradually turning to



## SPONGE CITIES, WUHAN, CHINA

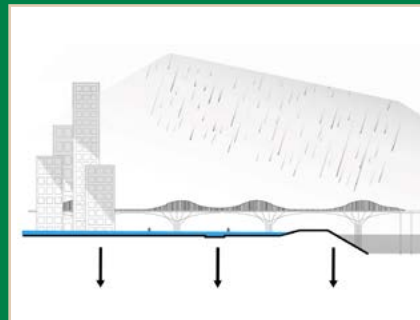
Camille Fong (Technical University Delft)

In 2015 the government of China launched the Sponge City Programme, helping 16 pilot cities transform densely populated areas into sponge cities to better adapt to urban flood risks. As the programme's name states, the goal is to create cities that function as a 'sponge', allowing for the storage, infiltration and purification of rainwater, slowing release, thereby reducing urban flooding, and facilitating reuse when needed. This strategy of so-called low impact development (LID) consists of green infrastructure such as bioswales, ponds and green roofs.

The city of Wuhan, originally known as the 'city of a hundred lakes,' has rapidly developed into a city of over 10 million inhabitants. This has led to the disappearance of many lakes which used to play an important role in flood mitigation. The city is now facing many water challenges such as urban flooding.

Arcadis tasked an interdisciplinary team of masters students from the

Delft University of Technology, in the Netherlands, to support the implementation of the Sponge City Programme in a new development in Wuhan. During a year-long project the team followed a research by design strategy, to come up with the conceptual design of the MengQiao bridge, to connect a network of elevated walkways connecting the city's buildings as a stormwater carrier to transport water from the green roof buildings to the park. After the park has reached its maximum storage capacity, excess stormwater is discharged into the Yangtze river. The bridge moreover provides a pleasant walkway for pedestrians.



more sustainable practices. Opening the streets for cycling attracts a range of follow-up initiatives promoting waste segregation, terrace farming and gardening, and healthy habits like yoga and Zumba classes to spill out in public space.

At their SG Farm in the middle of Singapore's buzzing financial district, TANAH's Michelle Lai and Huying Ng reconnected people to the origin of their food, by inviting them to help design and implement a temporary urban farm. People came by to take care of the plants or join a public discussion while hanging out on the seating made from recycled pallets. In the article 'Bringing Edge Food Futures Into The Spotlight' they describe how they wanted to use the temporary farm to spark civic imagination and change residents' relationship to the food chain, something that in Singapore's fast-paced environment tends to be permanently packaged and 'on the go'. The spin-off effects of these public displays of climate action are expected to have a huge impact on creating public support for the necessary change to come.



**Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.**



MARGARET MEAD

- **Work together to tackle the complex problem of climate change.**

Public space, as the natural nexus where various interests of all the city's users are negotiated day-to-day, is a great starting point to gear up the collaborative efforts needed to tackle climate change. All inspiring case studies in this section illustrate the great potential of multi-stakeholder collaborations to make an impact far beyond the sum of its parts. Bangalore's Cycle Day is the result of a successful public-private partnership between government and non-governmental organisations, that continues to connect more partners around common goals. Singapore's National Parks Board helps the city to achieve its vision City in a Garden by giving financial incentives to building owners, communities and residents to invest in more urban vegetation — also on private property — for the public good. In climate action collaboration is key, and making it visible in the public realm helps to create an environment that is more susceptible to co-creation for future innovation.

## MEDINI GREEN PARKS, MEDINI, MALAYSIA

Chris Parry (Johor Green)

Medini Green Parks is the development of two parks totalling 12 acres in the township of Medini in the new city of Iskandar Puteri. The project is part of Khazanah's placemaking initiative in Iskandar Puteri strategised by LabDNA and in collaboration with social enterprise JOGREEN. In 2015 JOGREEN pitched the idea of themed public parks to build value in urban green space and community around these ideas. Two ideas were accepted for development: Edible Park, 4.5 acres of edible landscape featuring orchards, gardens and an urban farm, and Heritage Forest, 7.25 acres of wild

landscape featuring native and regional flora.

The process took three years to realise with Edible Park launching in early 2018 to great success. The park became a venue for weekly workshops, tours and occasional festivals attracting public engagement, press and industry awards. Heritage Forest is currently being completed for launch in 2020. Both parks are maintained sustainably without chemicals or air conditioning, utilising rainwater harvesting, solar, and ethical hiring of staff.



Placemaking helps build trust in what a community can do together to overcome challenges, and empowers people to take action in their immediate environment. It builds bridges between disciplines and government silos, which is especially necessary in the era of climate change and for the challenges ahead.

- **Increase equity in the city by working on climate solutions.**

A growing body of evidence shows that walking is the most equitable mode of transportation and that more walkable or bicycle-friendly environments create opportunities for local entrepreneurs to flourish. On top of that, more sustainable modes of transportation promote healthier communities, through reduced air pollution and the active movement of people. Similar arguments can be made with respect to more equitable access to fresh produce, grown in the inner-city at urban farms and edible gardens. Even on a small-scale, the healthier habits it may inspire can have a great impact on people's lives. Access to urban nature additionally helps vulnerable urban dwellers reduce anxiety, stress and mental disorders, thanks to the relaxing effects of greenery and the increased opportunities for social connectedness that they provide. Publicly accessible climate solutions therefore have the potential to uplift the general well-being of people that may otherwise have less access to the mechanisms that promote happier and healthier lifestyles.

General well-being, in turn, promotes people's ability to wholly participate in society economically, and improve the livelihoods for themselves and their communities. As it was argued earlier, countries across the region have come a long way in poverty alleviation and welfare, and it would be beneficial if working on more climate-resilient cities will naturally continue those efforts.

- **Bridge the urban-rural divide with climate action.**

With the massive rural-urban migration happening globally in recent decades, it's easy to assume that the future will be urban. Yet, when it comes to tackling climate change, rural communities might have the answers on how to move forward more sustainably the coming decades. In the article 'Pasar Papringan: Finding a future in the past' Singgih S. Kartono illustrates beautifully how a rural pop-up market in Ngadiprono, Indonesia, leads the way in offering local food, artisanal goods with natural ingredients and agricultural produce, all of which are naturally plastic-free and collectively organised by the community. It is precisely these practices that cities should embrace to progress by learning from the heritage of rural communities, as the prototype of a more sustainable society.

Hiroyoshi Morita, Akito Murayama and Yasutoshi Sasaki showcase in the article 'Connecting Public Spaces and Basins with Woods' how nearly 60% of Japan's forests are planted. Promoting the use of wood in urban

## DOCKLESS BIKESHARE REVOLUTION IN CHINA

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In recent years a new mode of transportation has emerged in China: the dockless bikeshare.

Compared to traditional bikeshare systems with fixed stations and parking docks, this model allows a rider to lock and unlock a GPS-enabled bike anywhere by smartphones. As an effective way to promote green travel and solve the 'last mile' problem, dockless bikeshare has gained popularity quickly in China and around the world.

### AN EXPLOSION OF BIKES AND BIKING

Peking University school introduced the dockless bikeshare system (Ofo) in 2014. The company Mobike introduced a similar system into urban cities. With the development of the sharing economy, high-speed mobile networks, and smartphone technology, dockless bikesharing systems began to rapidly grow with over 77 dockless bikeshare companies and approximately 23 million bikes in 2017 in China. It's become so convenient for short distance commuters, which enables more people to bike in the city, reduce auto emissions and climate change by cutting vehicle journeys. But the rapid growth has come with some new challenges.

Now Chinese cities face blocked sidewalks, oversupply and bicycle graveyards in more than 20 cities. This raised deep concerns about quality control,

maintenance, management and financial supervision of dockless bikeshare companies. Facing these challenges, the Chinese government have started to implement policies to regulate dockless bikeshare systems. Also, cities now pay more attention to the biking environment and step up efforts to improve infrastructure to meet the surging demand for biking. Meanwhile, companies are exploring new uses of technological innovation, promoting life services and shared e-bike and e-scooters for sustainable development.

The dockless bikeshare, as one of China's "new four great inventions", has brought convenience to public travel. However, it has also brought negative impacts on the urban environment. Therefore, the city should actively explore the co-governance and co-management of the government, companies, and the public, and promote the delicate management of the industry.

### LOGICAL STEPS

- Integrate dockless bikeshare into city goals
- Set policies of dockless bikeshare
- Standardise industry management
- Promote user guidance
- Improve cycling infrastructure



areas will therefore prevent further ecosystem collapse and reduce flood risks for cities. It clearly shows the interdependence between our rural and urban environments. The use of wood has the potential to replace less sustainable building materials like concrete, and reduce and store carbon emissions. And as it is a relatively easy-to-handle material, it is excellent for use in community-driven placemaking activities, boosting active citizenship and a deeper connection between residents and their environments.

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**With inspiring initiatives emerging all around, public support and awareness is growing, making more permanent change possible.**

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- **Scale up best practices to become more climate-resilient - Asian cities have what it takes to transition rapidly.**

As seen with the fast economic growth across the region, Asian cities show that even though they are in the early stages of more integrated climate action, they are ambitious in their efforts. Strong governmental support and the scale of investments being made across the region will potentially help transition to more sustainable economies over the coming decades. And with inspiring initiatives emerging all around, public support and awareness is growing, making more permanent change possible. If urban practitioners continue to be able to show how climate resiliency measures lead to a better quality of life in cities, and added economic, social and environmental value for all involved, achieving the global climate goals becomes more likely every day.

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