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The Summary for Urban Policymakers of the IPCC Sixth Assessment Report (AR6)

What the Latest Physical Science of Climate Change Means for Cities and Urban Areas

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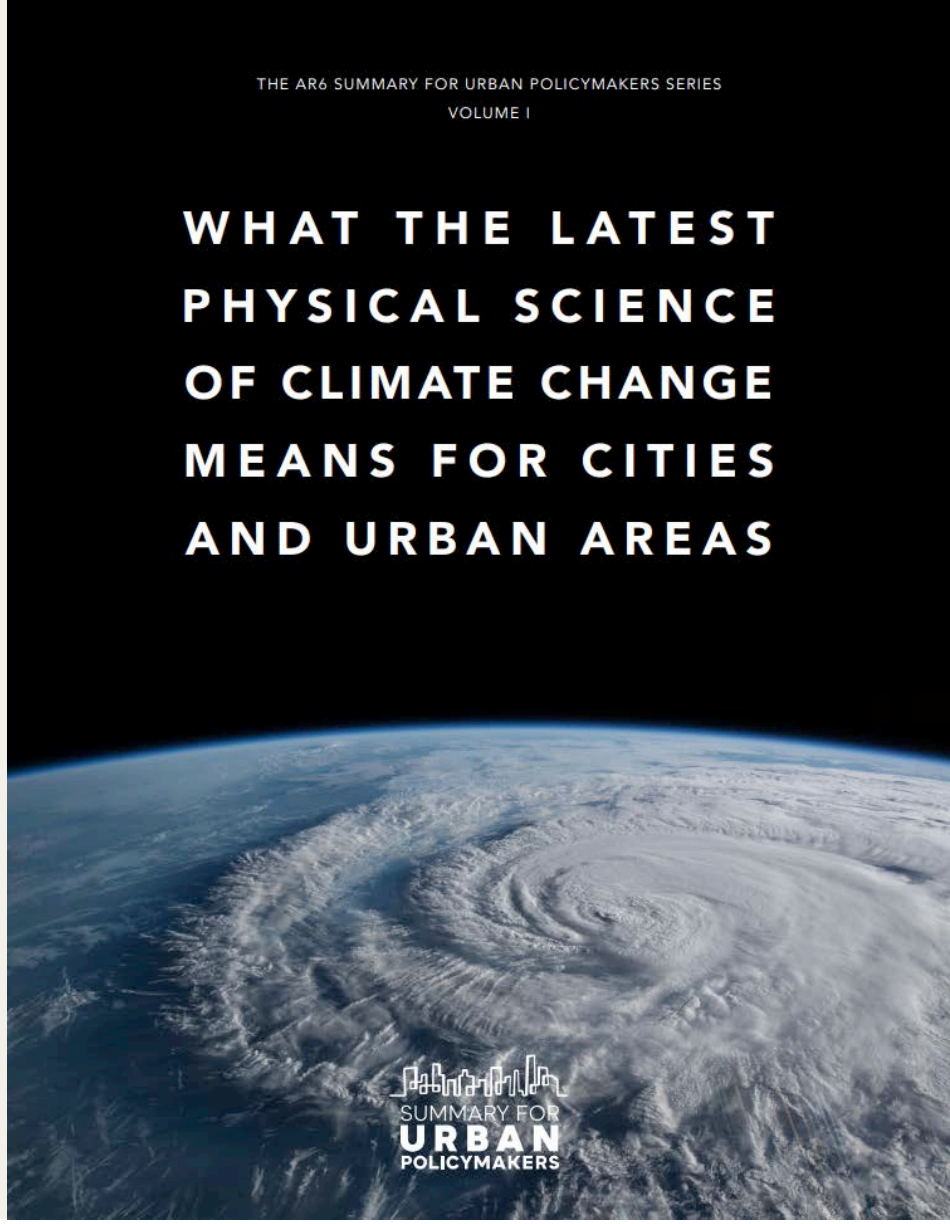
CoP27, Sharm El-Sheikh | 11th November 2022



SUMMARY FOR URBAN POLICYMAKERS

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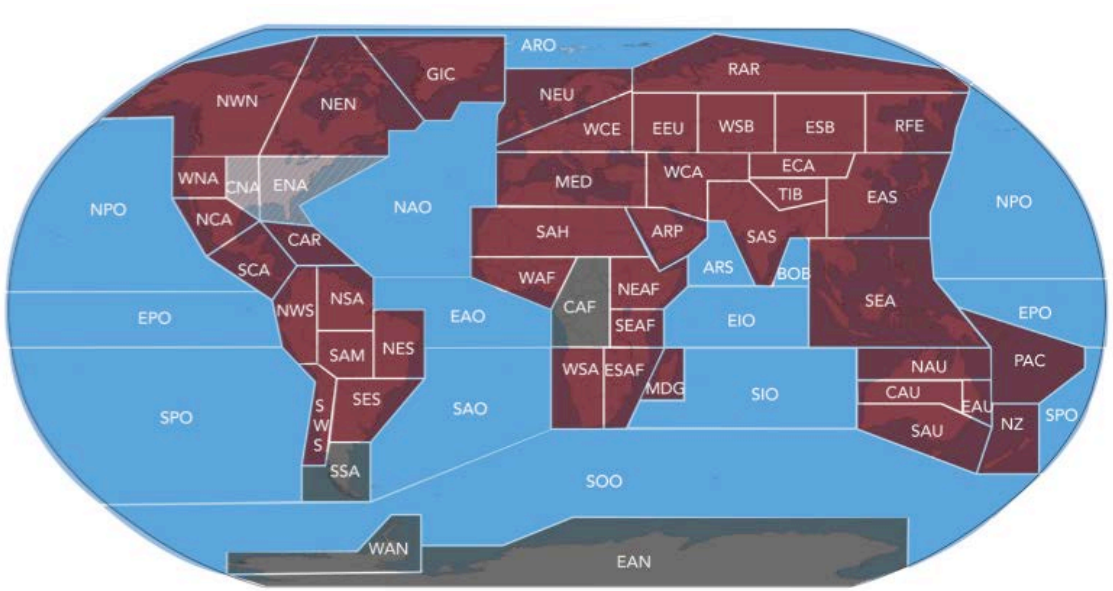
The climate change crisis is here. **Human-induced climate change is increasingly affecting every region and system of the world, including through more intense weather and climate extremes.**

Figure 1: Climate change is already affecting every inhabited region across the globe. Human influence contributes to many observed changes (since the 1950s) in weather and climate extremes.

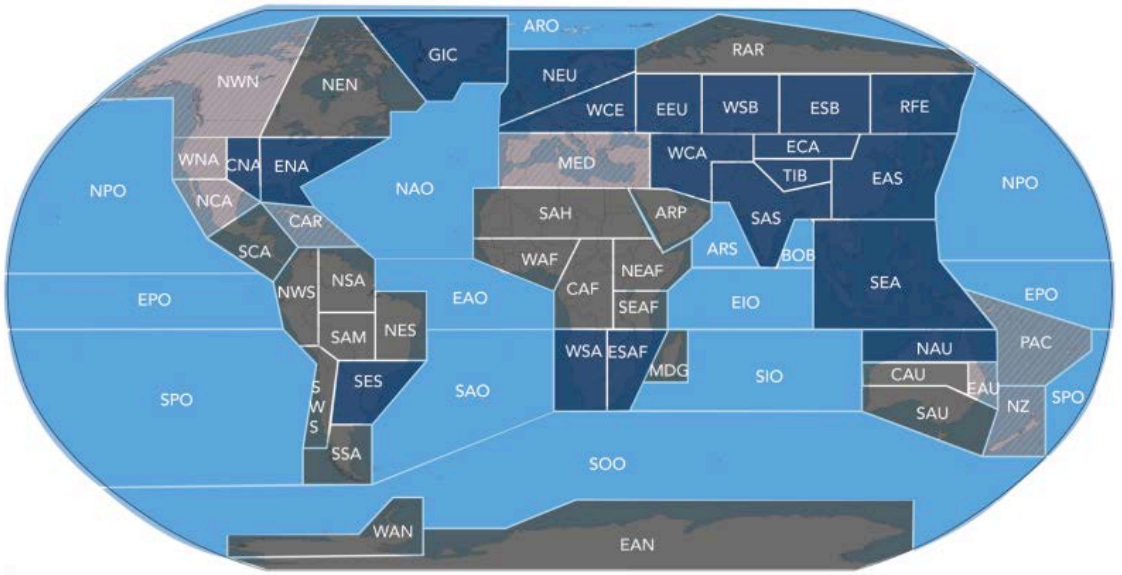


Increase

Low agreement in type of change for the region as a whole

Limited data/or literature

(a) Observed change in **hot extremes**



Increase

Low agreement in type of change for the region as a whole

Limited data/or literature

(b) Observed change in **heavy precipitation**

Figure Source: Derived from the IPCC AR6 WGI Summary for Policymakers Figure SPM.3

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Every region will experience concurrent and multiple changes in climatic impact-drivers at higher levels of global warming. In many places, these are causing compound events.

Image credits: Logan Abassi / UN Photo

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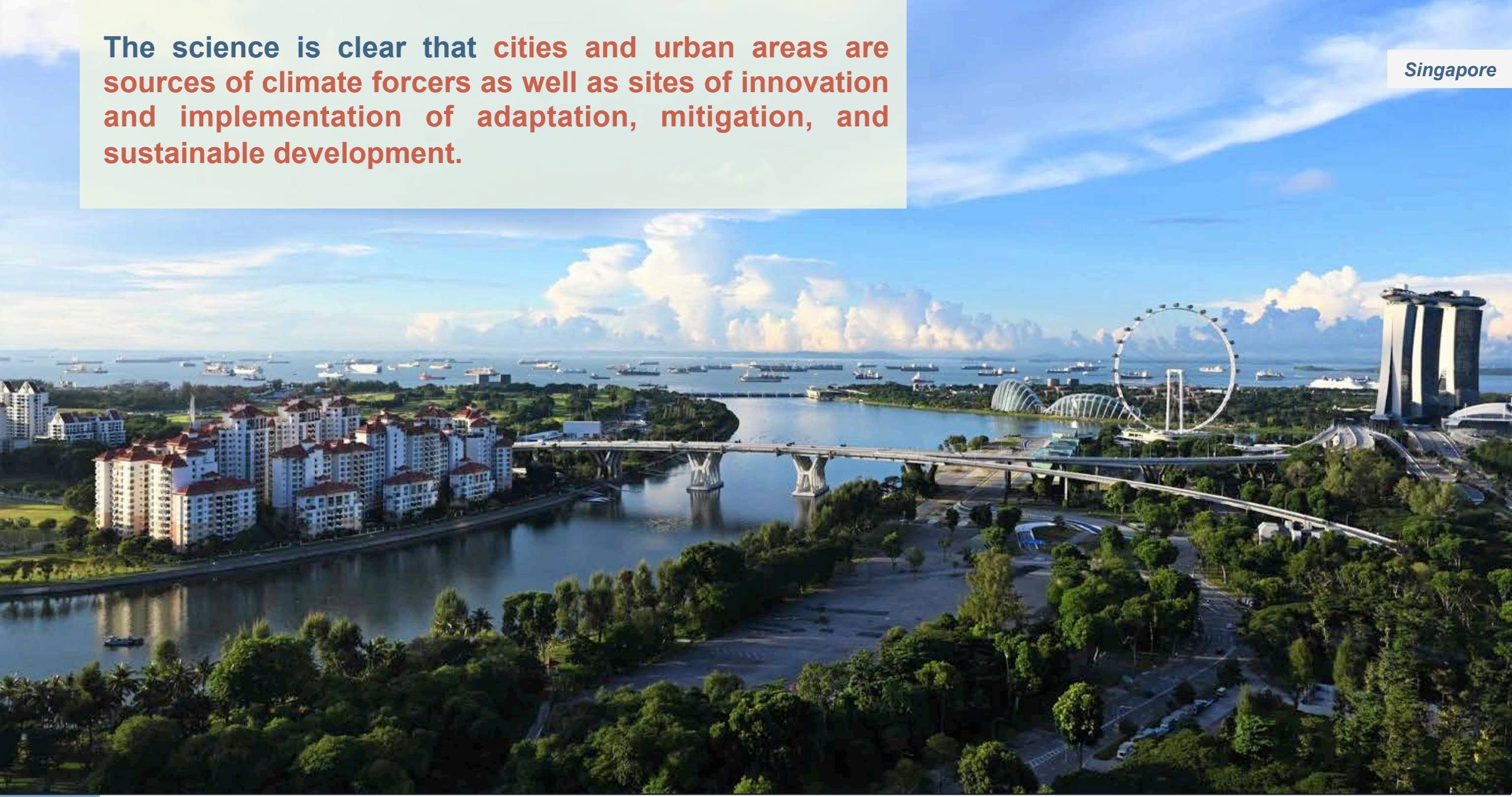
The science is clear that cities and urban areas are sources of climate forcers as well as sites of innovation and implementation of adaptation, mitigation, and sustainable development.



Singapore

Image credits: Mark Stoop / Unsplash,

Hangzhou, China

Emissions implied by current policies will cause global warming to exceed 2°C by around 2050. Even with strong emissions reductions, the increase of cumulative CO_2 emissions will result in global warming exceeding 1.5°C in the next 20 years.

Image credits: Paul Starkey / Ashden

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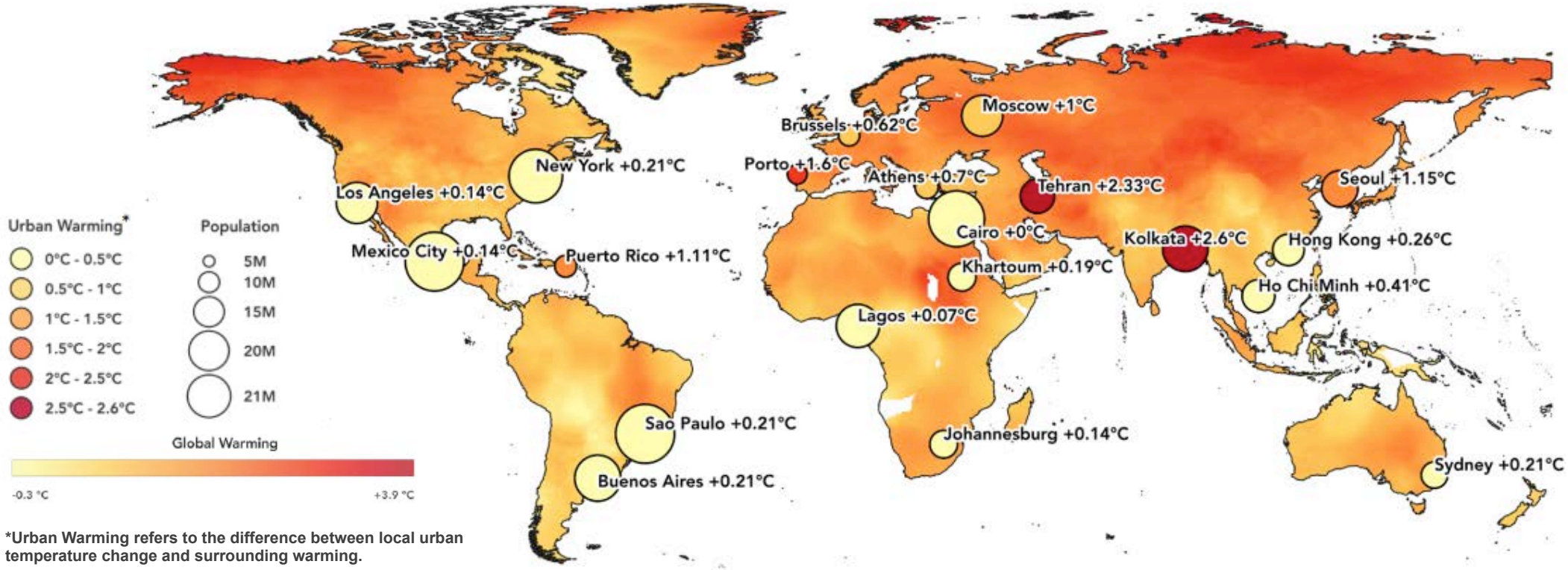
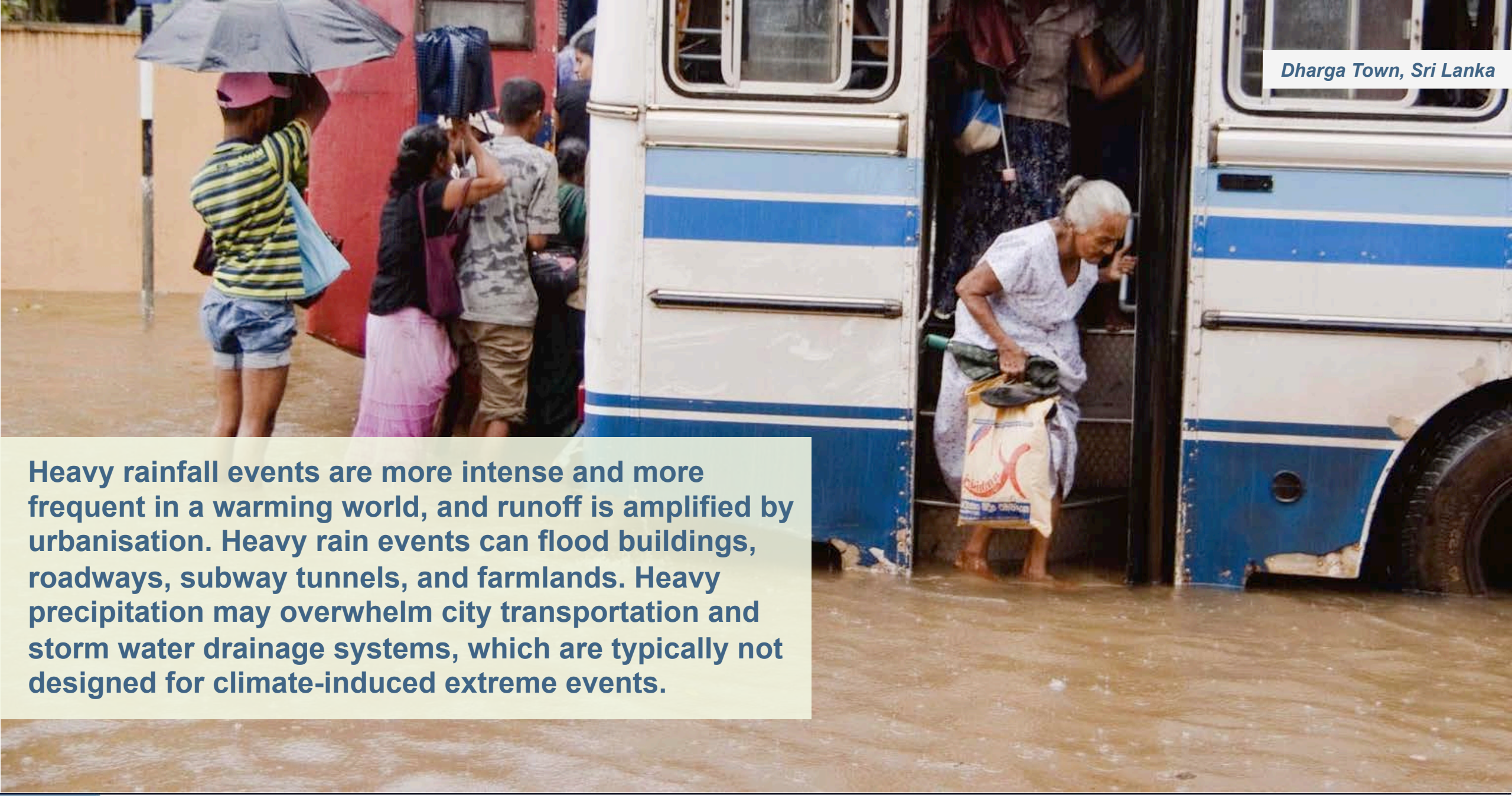
At current increases of global surface temperature (+1.1°C), warming is larger over land and in the Arctic, and amplified in cities. Most cities and urban areas will experience increases in local temperature of +1.5°C and 2°C earlier than other areas.

Figure 2: Past trends in global surface air temperature (1958-2018) with cities reporting significant temperature increases.



*Urban Warming refers to the difference between local urban temperature change and surrounding warming.

Source: Change in the annual mean surface air temperature over the period 1958-2018 based on the local linear trend retrieved from CRU TS (°C per 68 years). This map has been amended from IPCC 2021, Climate Change 2021: The Physical Science Basis, Chapter 10: Linking Global to Regional Climate Change; United Nations, Department of Economic and Social Affairs, Population Division (2018); World Urbanization Prospects: The 2018 Revision, Online Edition.



Dharga Town, Sri Lanka

Heavy rainfall events are more intense and more frequent in a warming world, and runoff is amplified by urbanisation. Heavy rain events can flood buildings, roadways, subway tunnels, and farmlands. Heavy precipitation may overwhelm city transportation and storm water drainage systems, which are typically not designed for climate-induced extreme events.

Image credits: Hafiz Issadeen

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Tacloban, Philippines

The combination of extreme sea level, increased by both sea level rise and storm surge, and extreme rainfall/river flow events will increase coastal flooding with the potential risk for widespread mortality and damage to housing, transportation and energy infrastructure.

Image credits: Erik de Castro / Reuters

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Figure 3: Cities are usually warmer than their surrounding areas due to factors that trap and release heat and a lack of natural cooling influences such as water and vegetation.

The combination of future urbanisation and increasingly frequent extreme climate events, such as heatwaves, will exacerbate heat stress in cities.

In the future, urbanisation will intensify urban heat island effects regardless of changes in the background climate.

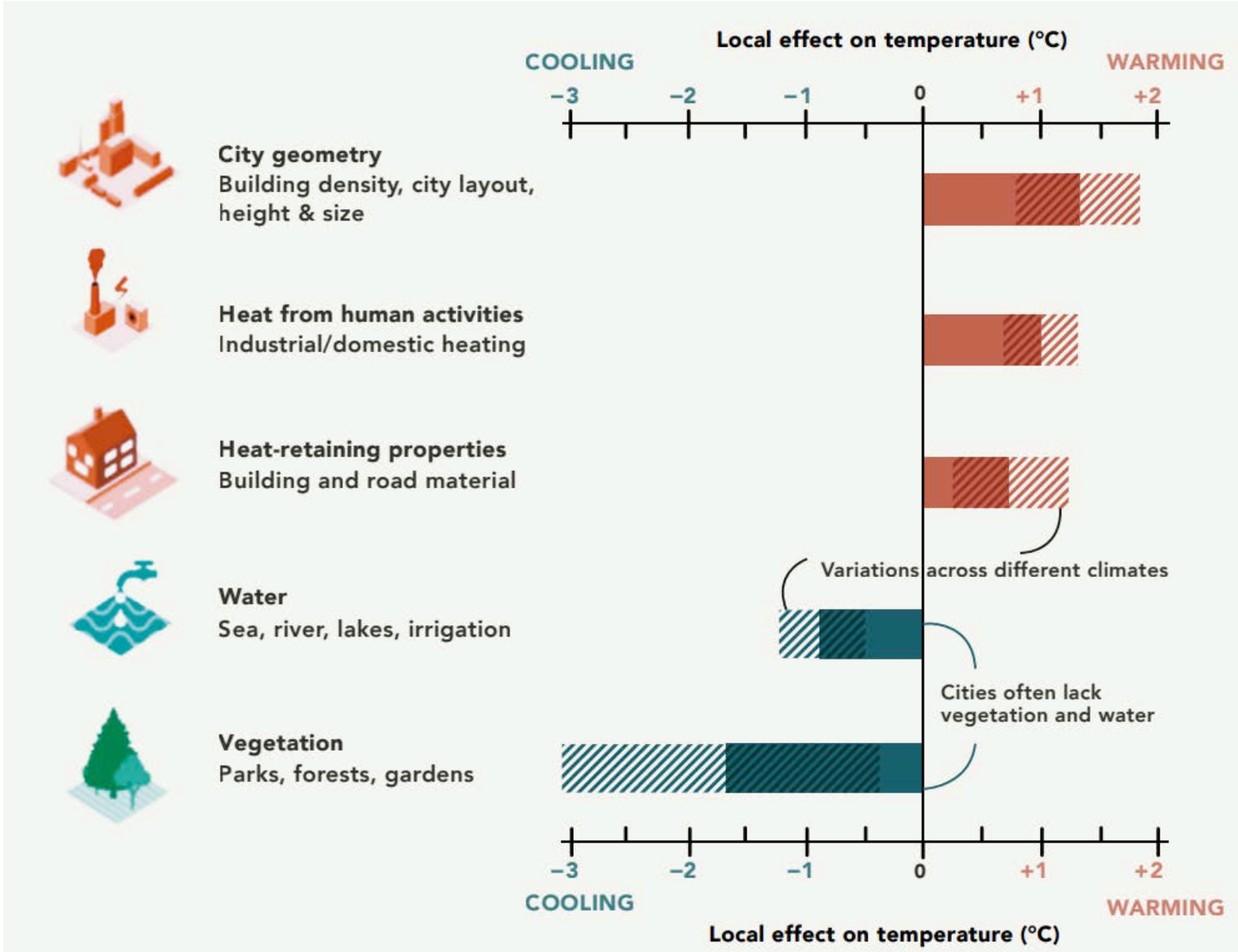

Figure Source: Derived from the IPCC AR6 WGI Chapter 10, FAQ10.2

The global community has a map of the solution space on climate change and sustainable development, with cities playing a central role in how we adapt and mitigate.

Image credits: Sandeep Viswanath

Future changes to our climate and how they affect us depend on the choices we make in our cities and urban areas today. Our climate is our future.

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