

Arup climate risk tool: protecting your infrastructure under climate change

Explainer

Accessible research from Climate Science for Service Partnership (CSSP) China, for decision-makers No.06

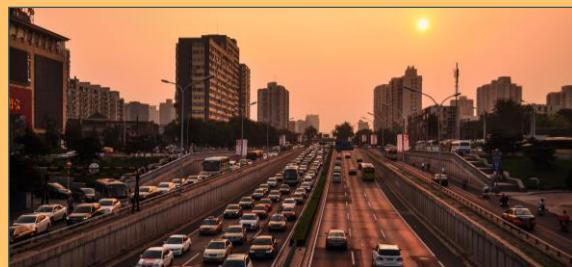


Image: Erdenebayar Bayansan, Pixabay

Focus

Arup has created a climate service that enables infrastructure planners, engineers and project managers in Chinese city authorities to assess the impacts of future climatic extremes, such as high temperatures or high rainfall, on critical infrastructure systems and to identify solutions to enable adaptation.

Based on research undertaken through the CSSP China project, the decision support tool provides easy access to an ensemble of trusted global climate model (GCM) datasets. The changing severity of hazards under future climate scenarios can be quantified and combined with the user's knowledge of city infrastructure to assess risk and plan for targeted adaptation.

Importance

Built infrastructure, such as transport, water and energy systems, ensure the effective functioning of cities and support quality of life. Damage or failure due to extreme heat or rainfall is likely to become more severe and/or more frequent due to future climate change, making future-proofing an essential part of planning, designing and operating infrastructure.

Historical records of temperature or rainfall extremes provide inadequate guidance in a changing climate. Arup's tool is accessible and provides direct, focused access to the trusted climate model data needed to assess future conditions, with clear explanations to support interpretation.

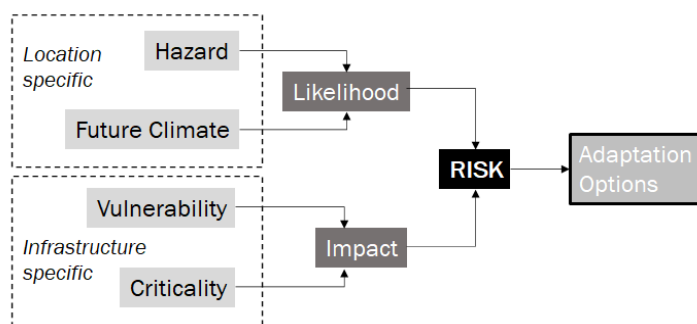
Approach

Users are guided through a process (above, right) to combine data from global climate models with user expert knowledge on:

Vulnerability: how sensitive a system is to failure in climate extremes.

Criticality: how vital a system is for the functioning of the economy, society, and other dependent systems.

Vulnerability and criticality are combined to give a



Information flow in the Arup climate risk tool

systematic evaluation of potential hazard impacts for a particular infrastructure system in a given location as the climate changes. Overall risk is determined and the user is guided to identify practical adaptation methods or technologies, to help prioritise investments to improve resilience.

Next steps

Arup's climate service tool, training and guidance resources have been implemented for four cities (Beijing, Shanghai, Wuhan and Shenzhen). For these cities, the tool can now be used to support decision making. Next steps include extending the tool to other cities.

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