CASE STUDY 1: Green Buildings | Singapore

Singapore's cityscape offers a prime example of green buildings designed for cooling. These structures are part of a city-wide initiative that uses planning tools to promote a greener built environment, featuring sky gardens, green facades, horizontal landscaping, water features, lawns, trees, planters, and urban farms.

Green infrastructure cools cities by encouraging evapotranspiration, creating shade, and increasing the albedo of built surfaces. Currently, green cover in Singapore spans over 40% of the land, with a target to green 80% of buildings (by gross floor area) by 2030, under the City in Nature vision—a key element of the Singapore Green Plan 2030. While results vary based on factors like vegetation type and density, green roofs and walls can lower surface temperatures by up to 17°C contributing to ambient temperature reductions of up to 5°C in the city.

A pivotal policy driving this is the Landscaping for Urban Spaces and High-Rises (LUSH) program, launched in 2009. It mandates that new developments include on-site greenery equal to the development's footprint. The government also covers 50% of the costs for green roofs and facades on existing buildings and incentivizes rooftop greenery in new constructions through gross floor area exemptions. The program has sparked innovation and reduced costs for vertical greening systems over time, with guidelines advising on plant choices for nutrition or biodiversity value.

CASE STUDY 2: Tree Planting | Kochi, India

In Kochi, India, a tree planting campaign illustrates the impact of cross-sector collaboration in reducing heat in vulnerable communities.

Kochi, located in Kerala, is home to 6.5 million people. By 2050, 24 Indian cities are expected to experience average summertime temperatures above 35°C. In Kochi, over 30% of residents are already exposed to such temperatures.

In 2019, the city launched a tree-planting campaign to combat extreme heat and coastal flooding. Trees provide shade and evapotranspiration, both of which cool surrounding areas. Research in India found that city wards with more vegetation had a 5.5°C difference in surface temperatures compared to less vegetated areas.

The program utilized geospatial technology and community knowledge to map existing tree cover and identify planting sites. It engaged stakeholders across sectors, including the Kochi Municipal Corporation (KMC), World Resources Institute India, and the Cities4Forests initiative, alongside educational institutions and resident associations.

The ongoing Kawaki initiative has planted over 1,200 trees and created jobs for more than 100 women over three years. The municipality has also supported community

engagement by partnering with local organizations, providing wages for tree planting and maintenance, and committing to expanding the project to new locations.

CASE STUDY 3: Parks and Urban Forests | Seoul, Republic of South Korea

An urban park in Seoul showcases how blue and green spaces can enhance thermal comfort.

Seoul transformed a 10km waterfront corridor, removing an expressway to restore the Cheonggyecheon stream. The project created greenspaces, pedestrian walkways, and cycling paths, reducing temperatures by 3.3°C to 5.9°C compared to nearby streets.

Blue and green spaces cool cities through evaporation and transpiration. Water bodies evaporate, and vegetation absorbs heat, converting it into water vapor that cools the air. These cooling effects can be amplified with supportive urban design to create "cool corridors" which channel windflows.

These spaces offer additional benefits, including reduced air pollution, increased biodiversity, recreational areas, and stormwater management. Early assessments of the Cheonggyecheon project revealed a 35% reduction in small-particle pollution and greater species diversity.

However, the project also highlighted potential downsides. Small businesses in the Cheonggye area—mainly in manufacturing, wholesale, and retail—were displaced. Some suffered financial losses, leading to resentment and distrust of the city government.). This underscores the need for inclusive planning and effective community engagement to avoid negative impacts in urban greening projects.