Cities on the front line of a changing climate

Urban centres account for more than half of the world’s population, most of its economic activity and the majority of energy-related emissions. The role of cities in reducing emissions and protecting their inhabitants is therefore central to effective climate policies.

**Impacts**

Climate change is expected to affect numerous aspects of urban life.

**Sea-Level Rise**

Two-thirds of cities with populations above 5 million are located in the Low Elevation Coastal Zone. Rising sea levels and storm surge flooding could have widespread effects on populations, property, and ecosystems, presenting threats to commerce, businesses and livelihoods.

**Food Insecurity**

All aspects of food security are potentially affected by climate change, including access to food, food production and price volatility. Climate change is likely to cause food production in some regions (including the ocean due to warming and acidification) to decline.

**Extreme Weather Events**

Changes in extreme rainfall could cause the amount of sewage released to the environment from combined sewage overflow and flooding to increase by 40% in some cities. Inland flooding is often made worse by uncontrolled city development.

**Increased Temperatures**

The mean temperature rise in some cities could be over 4°C by 2050, with peak seasonal temperatures even higher. More hot days will exacerbate urban heat island effects, resulting in more heat-related health problems and, possibly, air pollution.

**Freshwater Availability**

Risks to freshwater resources, such as drought, can cause shortages of drinking water, electricity outages, water-related diseases (through use of contaminated water), higher food prices and increased food insecurity from reduced agricultural supplies.

Adaptation is possible if complex, but cheaper in the long run than doing nothing. How cities adapt to the effects of climate change will vary enormously.

**Mitigation efforts can have positive impacts for generations to come**

**Energy Supply**

Reductions in greenhouse gas (GHG) emissions can be achieved by the use of low-carbon technologies including renewables, nuclear, and carbon capture and storage. Switching from coal for electricity or hydrogen produced from low-GHG sources.

**Transport**

Emissions can be reduced by avoiding journeys, shifting to low-carbon transport systems, enhancing vehicle and engine efficiency, and reducing the carbon intensity of fuels by substituting oil-based products with natural gas, bio-methane or biofuels, or with electricity or hydrogen produced from low-GHG sources.

**Buildings**

Retraining existing buildings can reduce heating energy requirements by 50–75% in single-family housing and 50–90% in multi-family housing at costs of about US Dollar 100-450 per square metre. In contrast, substantial new construction in fast-growing regions presents a great mitigation opportunity as emissions can be virtually eliminated for new builds.

**Energy Demand**

Increasing the efficiency of buildings, appliances and distribution networks will reduce energy demand. Changes in the awareness and behaviour of residents can also reduce demand. Projections suggest demand may be reduced by up to 20% in the short term and 50% by 2050.

**Low Carbon Cities**

Options for rapidly developing cities focus on shaping their urban and infrastructure development trajecories. For mature cities, options lie in urban regeneration (compact, mixed-use development that shortens journeys, promotes transit, walking/cycling, and adaptive reuse of buildings) and rehabilitation and/or conversion to energy-efficient building designs.

**Policy Instruments**

Approaches include co-locating high residential with high employment densities, achieving high land-use mixes, involving in public transit. The best plans for advancing sustainable urbanisation and low carbon development, especially in fast-growing parts of the world requires political will and institutional capacity.