



EcoFacts: Climate Change in Bangkok

Greater Bangkok is home to more than 10 million people or nearly 15 per cent of Thailand's population, although the registered population is closer to 6 million. The city's rapid growth as an industrial and urban centre is already placing strains on its environment. Climate change will exacerbate these pressures.

Temperatures are expected to rise as a result of global warming. The likely consequences on the city, already prone to flooding and land subsistence, will be severe. Bangkok and its suburbs are already experiencing more severe and frequent flooding and more days with temperatures above 35°C. Bangkok residents are likely to experience more floods, and impacts on infrastructure, water, health and food production, along with economic costs. Bangkok's dominance as Thailand's economic hub suggests that there will be economic repercussions for the country as well.

Rising greenhouse gas emissions (GHG), such as carbon dioxide (CO₂), are primary contributors to warming temperatures. Bangkok accounted for an estimated 61.23 million tons of CO₂ in 2007. Transportation, electricity generation and solid and waste water constitute the bulk of emissions in the city (90%). A breakdown of emissions by sector is given below.

Bangkok Facts and Figures:

Population: 10 million (15% of Thailand's population).

Total CO₂ Emissions: 61.23 million tons in 2007

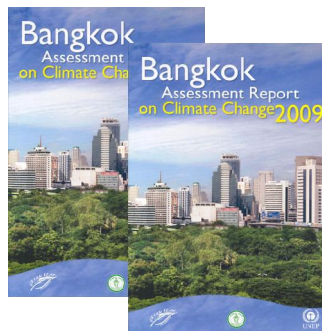
Per capita CO₂ Emissions: 7.1 tons in 2005

Land subsistence rate: 5-10 mm up to 30mm yearly in certain areas.

Water supply: 91% from Chao Phraya and Mae Klong Rivers

CO₂ Emissions of Bangkok City by Sector in 2007

Source	Emissions (Millions tons per year)	Percentage
Electricity	20.43	33.37
Transportation	23.07	37.68
Solid waste and waste water	12.16	19.86
Other	5.57	9.09
Total	61.23	100



In 2005, Bangkok residents emitted a total of 43m tons of CO₂, as much as London (44m tons) but higher than Toronto (24m tons). In per capita terms, Bangkok residents produced as much CO₂ as New Yorkers (7.1 tons per capita) in 2005, higher than that of Londoners (5.9 tons per capita) but lower than levels produced Toronto residents (9.6 tons per capita).



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Impacts

Floods

Bangkok is low-lying, rising a little more than 2 meters above mean sea level at its highest point and therefore naturally prone to flooding. The city also suffers from land subsidence, caused by over-pumping of groundwater and the thick soft clay on which the city is built. Each year, parts of the city sink by 5-10 mm and by as much as 30 mm in outlying south-eastern and southwestern areas. This subsidence, when combined with a rising sea level could leave Bangkok under 50-100cm of water by 2025. Almost 55% of the city would be affected by floods if sea level rose by 50cm and 72% would be affected if sea levels rose by 100cm.

Water

Most of Bangkok's water supply (91%) comes from the Chao Phraya and Mae Klong rivers. Climate change will affect the flow of waters in the two rivers, affecting the city's water supply. This projected change in water supply may be further exacerbated by increasing demand for water as temperatures rise, from households and industries. Since Bangkok is expected to continue to grow over the next 10 years, the problems of water supply and contamination of both surface and ground waters may worsen.

Health

Climate change has the potential to influence the incidence and spread of infectious diseases transmitted by mosquitoes, ticks, fleas, and rodents. Temperature increases, coupled with stagnant flood waters, are breeding ground for mosquitoes which are the vectors of malaria and dengue fever. Malaria infection is also expected to rise substantially. Besides the tragic human toll, the potential financial implications could be in the thousands of millions of Baht.

Food Production

Rising temperatures may have a significant impact on the crops and other plants grown in and around Bangkok.

Options for Action

The Bangkok Assessment Report on Climate Change 2009 sets out a number of options for climate-proofing the city. These include improving local public health infrastructure and disease surveillance and prevention programmes, creating early warning systems for extreme weather events and implementing stricter zoning and building codes to minimize damage from storms and sea level rise.

To deal with these threats, the Bangkok Metropolitan Administration has adopted the Action Plan on Global Warming Mitigation 2007-2012, which calls for it to: expand mass transit and improve traffic systems; promote the use of renewable energy; improve electricity consumption efficiency; improve solid waste management and wastewater treatment efficiency; and expand park areas. The Action Plan is aimed at bringing about a reduction in Bangkok's greenhouse gas emissions over a period of five years, to 15 percent below the levels currently projected for 2012.