

Development in Brief



No 31, 5 November 2014

The Convergence of Two Megatrends... Urbanisation and Climate Change

Author: Michael Gruber und Dr Florian Wieneke

Editor: Annemie Denzer

Climate change and urbanisation are two megatrends of our times: for the first time in the history of mankind, the majority of the population is living in cities. At the same time, anthropogenic global warming is increasing the frequency and severity of extreme weather events and slow-onset events. Both trends are closely associated with one another: on the one hand, cities contribute significantly to climate change. On the other hand, they are particularly vulnerable to its consequences: due to the high density of people and infrastructure assets, disasters can cause – within hours – particularly heavy loss and damage.

Cities as the "drivers" of climate change

According to recent surveys by the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA), about 70% of global energy consumption and more than 70% of CO₂ emissions are already attributable to cities. Buildings and their use as well as transport systems have particularly high energy demands. Given the persistent urbanisation trend, in the future the increase in urban energy consumption will concentrate primarily on developing countries and emerging markets (DC/EM). Current projections show that a doubling of the urban population requires at least a threefold increase in the amount of urbanised land. Within just 30 years, cities will need as much additional space as has been covered with buildings in the history to date. If construction technologies do not change, manufacturing the required construction materials alone would cause 470 gt CO₂, i.e. 15 times the global CO₂ emissions in 2008.

Furthermore, the largely sealed surface areas of cities create heat islands. The higher temperatures increase the energy consumption needed for cooling, while the

waste heat from cooling systems generates more heat. The tendency towards higher average incomes and urban lifestyles implies that more resources and energy are consumed than in rural areas. Urban consumption patterns mostly lead to rising demand for transport and to more waste, with associated climate-damaging consequences.

Cities as the "victims" of climate change

However, cities are not only the drivers of climate change; they are also particularly heavily affected by it. They are vulnerable areas of high population density, concentrated infrastructure and economic centres that are increasingly impacted by the frequency and severity of extreme weather events (heat waves, storms, torrential rain) and the slow-onset events such as rising sea levels (floods, salt water intrusion). The impact is enormous. The 2011 freshwater flood in Bangkok with an amount of loss of almost USD 50 billion, corresponding to about 10% of the national GDP, was the most expensive in history. In 2012, Hurricane Sandy showed how vulnerable even modern metropolises are. New York alone suffered 48 fatalities and direct economic damage in the amount of USD 68 billion. More than 300,000 houses were destroyed, while dozens of tunnels and metro stations were flooded, leading to massive losses in working time. 8.5 million people and numerous companies were affected by prolonged power outages. The New York Stock Exchange had to close for two full days, 12,000 flights were cancelled and 70% of the oil refineries on the East Coast had to cease production. The damage incurred in cities can set back any development progress by many years, especially in developing countries and emerging markets. SwissRe conducted an analysis of the world's 616 largest cities (about 1.7 billion people, 25% of the global population, 50% of global GDP) with regard to

their vulnerability in the face of natural hazards; two thirds thereof are located in developing countries and emerging markets. Given the focus of urbanisation on coastal and delta regions, floods pose the greatest risk. Even if calculations are based on optimistic assumptions regarding sea-level rise for the years 2030-2070, the estimated cumulative cost amounts to up to USD 2,500 billion for the same period, unless appropriate mitigation measures are taken (Nature Climate Change 2013/3). In addition earthquakes and storms are considerable risks – often, metropolitan areas are forced to protect themselves against or adapt to several types of natural hazards at the same time.

Uncontrolled urbanisation in particular leads to less robust buildings and infrastructure, often in high risk areas. The poorer part of the urban population especially has few options to improve its resilience against climate effects by, for instance, building weather-proof houses, roads and waste water systems, obtaining legal protection through land titles, or making financial provisions by saving or taking out insurance, or to build up a new existence in safe regions.

Challenges for Development Cooperation

Urban climate change mitigation is imperative to achieve a significant and sustainable reduction in global greenhouse gas emissions. In order to reduce emissions, cities need support in planning, designing and financing climate-friendly structures with energy-efficient buildings and transport systems, fresh air corridors and sufficient green spaces. Cities in developing countries and emerging markets are particularly poorly equipped for the effects of climate change. Urban adaptation to climate change is not only urgently needed for humanitarian reasons; it is also required to secure economic development in the long term. Here, infrastructure and construction measures need to be designed in such a way that they prove to be climate-resilient solutions. Development cooperation helps to find the corresponding approaches for the two megatrends of urbanisation and climate change and to implement these together with partners. ■