

Climate change could triple population at risk from coastal flooding by 2070, finds OECD

The impact of climate change and urban development could more than triple the number of people around the world exposed to coastal flooding by 2070, according to a [new report](#) by the OECD, co-authored by experts from academia and the private sector<sup>1</sup>.

*Ranking port cities with high exposure and vulnerability to climate extremes* finds that around 150 million people could be exposed to a 1 in 100 year coastal flood event by 2070, up from 40 million today. The estimated financial impact of such an event would also rise to USD 35 trillion by 2070, up from USD 400 billion today.

The study analyses the exposure of people and property and infrastructure to a 1-in-100 year flood event in over 130 key port cities worldwide. A 1-in-100 year flood event is a commonly accepted risk assessment standard. The study aims to help policy makers determine where to focus adaptation strategies to climate extremes and to understand the potential benefits of mitigation policy. It is the first in a series of OECD reports looking at the economic impact of climate change on cities.

In its estimate of the impact of climate change, the study assumes mean sea level rise of 0.5 meters by 2070. This estimate includes the contributions from melting ice sheets that have proved important over recent decades and is consistent with a medium to high risk scenario.

Mitigation strategies will slow and limit the exacerbating effects of climate change on coastal flood risk, the report notes. This will bring precious time for cities to implement adaptation measures. Studies show that putting effective coastal defences in place can take 30 years or more. Adaptation will have to move to the top of the policy agenda today if it is to make a difference tomorrow.

Around half of the total population exposure to coastal flooding caused by storm surge and damage from high winds is contained in just ten cities today. Mumbai has the highest number of people exposed to coastal flooding. But by 2070, Kolkata (Calcutta) will be the most vulnerable, with the exposed population expected to increase over seven times to more than 14 million people.

Over the coming decades, the unprecedented growth and development of the Asian mega-cities will be a key factor in driving the increase in coastal flood risk globally. In terms of population exposure, Kolkata is closely followed by Mumbai, Dhaka, Guangzhou, Ho Chi Minh City, Shanghai, Bangkok, Rangoon and Hai Phong. Miami stands out as the only top ten city situated in a developed country.

The cities with the highest value of property and infrastructure assets exposed to coastal flooding today are primarily in developed countries. Miami is the most exposed city today and will remain so in 2070, with exposed assets rising from approximately US\$400 billion today to over US\$3.5 trillion. By 2070, eight of the most exposed cities will be in Asia. Guangzhou is the second most exposed city in terms of assets, followed by New York, Kolkata, Shanghai, Mumbai, Tianjin, Tokyo, Hong Kong, and Bangkok, respectively.

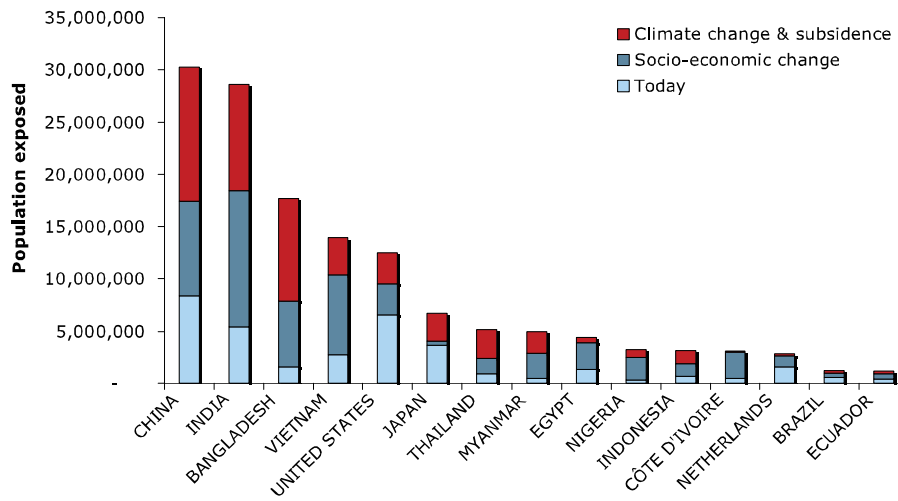


Figure 1: Top 15 countries by population exposed today and in the 2070s, showing the influence of future climate change vs. socioeconomic change

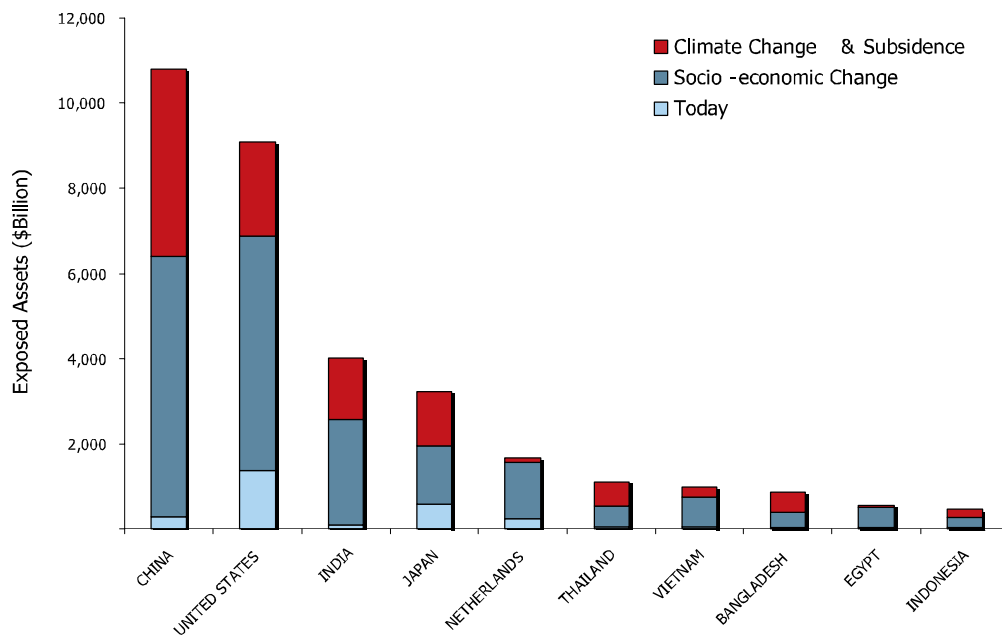


Figure 2: Top 10 countries by assets exposed today and in the 2070s, showing the influence of future climate change vs. socioeconomic change

Nicholls et al (2007), "Screening Study: Ranking Port Cities with High Exposure and Vulnerability to Climate Extremes: Interim Analysis: Exposure Estimates", OECD, Paris.

This report - ranking of the world's cities most exposed to coastal flooding today and in the future - is part of a series planned by the OECD on the theme of Cities and Climate Change. Further work will look at the effectiveness of flood defense measures and the vulnerability of key cities globally.

For further information, journalists are invited to contact [Jan Corfee-Morlot](#) of the OECD's Climate Change division (tel. + 33 1 45 24 79 24)

### **Other author contact details**

Robert Nicholls, University of Southampton and Tyndall Centre, 44-23-8059-4139; 44-777-8592564; [r.j.nicholls@soton.ac.uk](mailto:r.j.nicholls@soton.ac.uk)

Celine Herweijer, RMS, 44 20 7444 7723; [celine.herweijer@rms.com](mailto:celine.herweijer@rms.com)

Stephane Hallegatte, CIRED and Météo-France, tel: 33 6 78 27 13 62; [hallegatte@centre-cired.fr](mailto:hallegatte@centre-cired.fr)

For more information on the OECD's work on climate change, please see: [www.oecd.org/env/cc](http://www.oecd.org/env/cc)

---

<sup>i</sup> This study was jointly authored by Risk Management Solutions and academics representing the University of Southampton, the Tyndall Centre, Météo-France and the Centre International de Recherche sur l'Environnement et le Développement (CIRED).

Formatted: Font: 11 pt