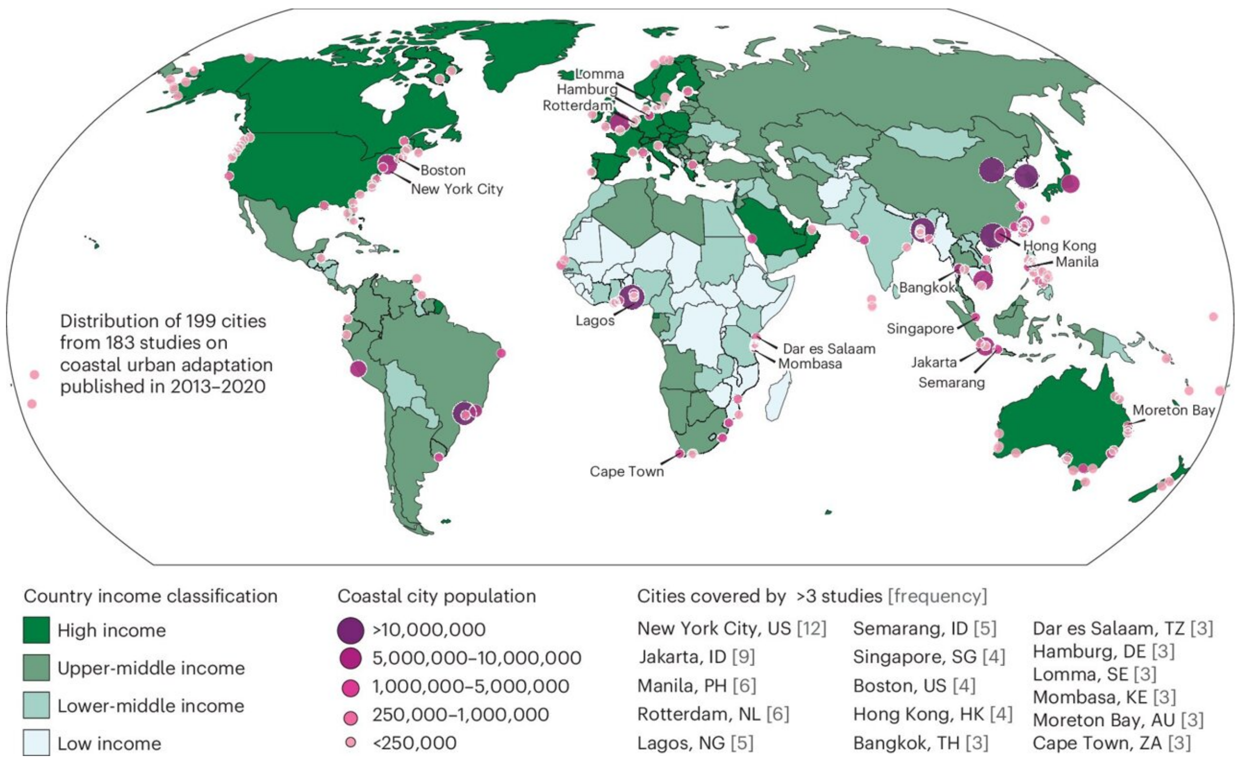
PHYS.ORG

Coastal cities must adapt faster to climate change, say researchers

August 27 2024



Geographical and economic distribution of coastal cities in the assessed literature. Credit: *Nature Cities* (2024). DOI: 10.1038/s44284-024-00106-9

Coastal cities play a key role in the global economy and have important functions for society at large. At the same time, they are severely affected by the impact of climate change. That is why their role in global climate adaptation is crucial.

To find out how coastal cities are adapting, an international team led by Professor Matthias Garschagen, a geographer at Ludwig-Maximilians-Universität München (LMU), has analyzed the current state of adaptation. The study is published in *Nature Cities*.

Based on studies of 199 cities across 54 countries, the researchers investigated whether and how cities take certain risk factors into account in their adaptation efforts. Climate factors like rising sea levels, storms, flooding and heat were among the key parameters considered.

Other aspects were also taken into account in the analysis, such as the exposure and vulnerability of the population, the infrastructure and the ecosystems in the respective region.

Climate measures are mostly inadequate

Most of the measures taken to adapt to climate change relate primarily to sea level rise, flooding and, to a lesser extent, storm surges, cyclones and erosion. Technical and institutional measures such as large-scale levees or urban planning innovations are more common in wealthier regions like North America and Europe.

In less prosperous regions such as in many parts of Africa and Asia, behavior-related measures are the dominant type, with affected households and companies being largely left to their own devices.

Overall, the LMU researchers found that most adaptation measures are inadequate in their depth, scope and speed—regardless of the region or its prosperity. The researchers also found little evidence of a sustainable reduction in risk as a result of the measures taken.

"Our findings reveal that there is plenty of work still to be done on all levels," explains Prof. Garschagen.

"There has been little truly far-reaching change involving a fundamental rethink of risk management. Cities often attempt to optimize their disaster management on the basis of past experience without fundamentally questioning whether these approaches are still going to be viable in the future," says Garschagen.

Global research on climate change needs to be done in all regions of the world

The research also found that it is rare for adaptation planning to be based on quantifiable factors. Although cities do take future natural risks such as flooding and heat into account, they rarely consider socioeconomic factors such as future trends in societal vulnerability or spatial growth and exposure.

"But those trends are important," says Garschagen, "because the Lagos or Jakarta of today is not the same as it's going to be in 20 years' time. There are certainly big research apps and we need better scenarios and better modeling methods. Another important question is about when it makes more sense to abandon coastal protection measures and consider resettling the population instead."

Garschagen is therefore calling for a major increase in research activity in the Global South. Most of the research activity to date has been concentrated on cities in the Global North. "Global climate change research that covers all regions of the world would enable us to fight the climate crisis faster and more effectively," says Garschagen.

More information: Mia Wannewitz et al, Progress and gaps in climate change adaptation in coastal cities across the globe, *Nature Cities* (2024). DOI: 10.1038/s44284-024-00106-9

Provided by Ludwig Maximilian University of Munich