

## AS THE SEAS COME CLOSER

Relevant for: Environment | Topic: Environmental Degradation - GHGs, Ozone Depletion and Climate Change

“Large portions of coastal cities like Mumbai could be fully submerged by 2050.” Picture shows a home in the city built next to the sea during high tide in September. | Photo Credit: [PUNIT PARANJPE](#)

How many people will be forced to migrate as a result of climate change? Figures range from tens of millions to hundreds of millions, but the multiple entanglements of climate change make it difficult to get accurate estimates. People may move because of drought, violence, degradation of local ecosystems, war or job loss. Poverty, adverse effects of globalisation and conflict may get worse with climate change, which is why it is often referred to as a “threat multiplier”.

Getting accurate sea level rise (SLR) projections has also always been difficult. Along with expansion of warm waters and melting of glaciers, subsidence of land also increases relative SLR. Models for glacier melt are not as well developed as other models that study global warming. SLR projections going beyond 2050 are therefore not as accurate as those until mid-century. There is broad agreement that if high emissions of greenhouse gases (GHGs) were to continue, average global SLR could be as high as two metres by the end of this century.

Past studies, which used NASA’s Shuttle Radar Topography Mission (SRTM) database, underestimated the land and people affected by SLR because tree-tops and tall buildings caused errors in assessments. A new study by Scott Kulp and Benjamin Strauss, published in *Nature Communications*, uses neural networks to improve accuracy and finds that the area affected by SLR will be substantially more than previously estimated. This means that the various effects from SLR: coastal flooding, salt water intrusion into land, destruction of coastal infrastructure, communities and ecosystems will be much more than anticipated.

While earlier measures suggest that five million people in India will be annually affected by coastal flooding, the new estimates point to 36 million; similarly, in Bangladesh instead of five million, 42 million will be threatened. By 2050, in a scenario that limits warming to 2°C above average pre-industrial temperatures, about 150 million people worldwide will be permanently below the high tide line along the coast and, by 2100, the numbers will rise to 360 million people. The new estimates indicate that about a billion people reside on land along the coast going up to an elevation of 10 metres (the low elevation coastal zone) and the bulk of them, more than two thirds, are below the five-metre elevation.

Most of the people found to be at risk from coastal events live in Asia — residing in countries like China, Bangladesh, India, Vietnam, Indonesia, Thailand, the Philippines and Japan.

Very large fractions of coastal populations in these countries will be vulnerable. Other than Asia and the Netherlands, there are 20 countries (13 of which are small island nations) in which more than a tenth of their population are expected to reside below the high tide line by 2100, and this is with deep cuts to emissions. Coastal cities, such as Alexandria, Ho Chi Minh City, Basra and Shanghai are among the most vulnerable and large portions of Mumbai and Kolkata will be fully submerged by 2050.

The effects on the economy, coastal communities, infrastructure and land will be immense and people living along the coast will be forced to move inland, probably to nearby towns and cities. When this is not possible, such as on small island nations or in low-lying delta regions like Vietnam, people will be forced to move across borders, thus affecting political stability.

Denial cannot be a mechanism to deal with these anticipated challenges from climate change.

Preparing for SLR will entail protecting the coast through measures such as natural barriers, levees, flood barriers and even hard barriers. But engineering protection mechanisms are expensive and have consequences for the coastline. Stopping infrastructure construction along the coast and integrating anticipated SLR effects into coastal planning are essential. The government should not be in a situation of moral hazard where it ends up bailing out investors, insurers and others who have increased their exposure to risk. Planning for retreat from the most vulnerable areas well ahead of time is essential. Urban policies, especially in mid-size towns, should integrate proposals for new migrants.

Turning border regions into fortress worlds will also not be justified, both in practical and ethical terms. What is required is preparation in advance with regional policies for labour, regional agreements for migration and for advance skill development.

Given that South Asia is one of the most vulnerable regions to climate change and the countries here share ecological zones, borders and coastlines, in addition to language and family histories, coordinated management of extreme events, advance preparation for migration into mid-size towns and better ecosystem support in the hinterland are useful ways to collaborate and build regional partnerships. And, since migrants in general cannot, for the most part, be distinguished from climate migrants, rights, services and policies need to be applied to all migrants. Otherwise, countries will create multiple classes of migrants — as many have accused Australia of doing — based on their reasons for moving and places of origin.

It is tempting to assume that these are impossible goals to set for India, but that is a short-sighted perspective. Our long history has shown that the subcontinent has always been a place that welcomes people. Investing in the rural economy, reducing unemployment, reducing poverty and improving measures for sustainability can improve people's lives and increase their resilience and openness to "others". The protests across the world by people of all ages show that there is fervour for transformation to deal with the climate crisis. This is our historic moment to act decisively.

Sujatha Byravan is a scientist who studies science, technology and policy

You have reached your limit for free articles this month.

Register to The Hindu for free and get unlimited access for 30 days.

Already have an account ? [Sign in](#)

Sign up for a 30-day free trial. [Sign Up](#)

Find mobile-friendly version of articles from the day's newspaper in one easy-to-read list.

Enjoy reading as many articles as you wish without any limitations.

A select list of articles that match your interests and tastes.

Move smoothly between articles as our pages load instantly.

A one-stop-shop for seeing the latest updates, and managing your preferences.

We brief you on the latest and most important developments, three times a day.

\*Our Digital Subscription plans do not currently include the e-paper ,crossword, iPhone, iPad mobile applications and print. Our plans enhance your reading experience.

Support quality journalism - [Subscribe to The Hindu Digital](#)

Please enter a valid email address.

How an idea for a 'perfect Mumbai feature story' failed to materialise

Subscribe to The Hindu now and get unlimited access.

Already have an account? [Sign In](#)

Sign up for a 30-day free trial. [Sign Up](#)

Support The Hindu's new online experience.

Already a user? [Sign In](#)

**END**

Downloaded from **crackIAS.com**

© **Zuccess App** by crackIAS.com

CrackIAS