

SEVEN CITIES REVEAL COST OF FLOODS CAUSED BY CLIMATE CHANGE

Relevant for: Environment & Disaster Management | Topic: Environmental Degradation - GHGs, Ozone Depletion & Climate Change

A view of the Cheruthoni town from atop a hill near the Idukki dam after the shutters of the dam were opened after a quarter century to release water into the Periyar. | Photo Credit: [H. Vibhu](#)

Until now, scientists have often framed climate change in terms of the future.

But a landmark report issued by the U.N.'s Intergovernmental Panel on Climate Change (IPCC) on Monday, October 8, 2018, states that without "rapid, far-reaching and unprecedented changes in all aspects of society," our world will exceed 1.5°C much sooner than we think — as early as a dozen years — which will increase the likelihood of floods, heatwaves and droughts.

As higher temperatures lead to sea level rise and more extreme rainfall, more and more people around the globe are experiencing catastrophic floods.

[Orb Media](#) looked at seven locations around the globe that have already seen one of the consequences of global warming: flooding as a result of sea level rise and extreme precipitation.

"One of the key messages that comes out very strongly from this report is that we are already seeing the consequences of 1°C of global warming through more extreme weather, rising sea levels and diminishing Arctic sea ice," said Panmao Zhai, co-chair of the IPCC's Working Group on the physical science of climate change.

Under water: How rising waters cost us all

Whether it's a storm surge in São Paulo, a flash flood in Toronto or an airport underwater in India, these floods all have one thing in common: they cost a lot. Aside from the lives lost and the immediate damages, every flood has a series of ripple effects on other costs like food prices, disruptions to local businesses and long-term damage to people's livelihoods. Often the most irreplaceable loss is also the least tangible: time. Businesses lose a tourist season; farmers lose a planting season; students lose weeks of school.

The human and financial costs of climate-related flooding are already much higher, longer-lasting and far-reaching than we thought. [One study](#) found that a single hurricane can cause a country's national income (including GDP) to decline for the next two decades. [Another found](#) that without large-scale adaptations, river flooding could cause a 17% increase in global economic losses over the next 20 years.

Kerala, India

In August of 2018, heavy monsoon rains flooded most of Kerala, India, with more than 400 deaths and upwards of a million displaced citizens. The [Cochin International Airport](#) — the first airport in the world to be fully powered by solar energy — was completely flooded and had to close for two weeks, leading to a cost of \$27 million of lost revenue. Aside from the physical destruction, the tourism season from the annual Onam celebration was lost, causing economic ripple effects on businesses as well as the local population.

Arun Thankappan and his mother, Ambika, work at the airport. Aside from 18 days of salary, they lost nearly everything they worked their lives to build when floodwaters destroyed their home. Arun was able to hastily grab two dresses for his mother, and the suitcase of diplomas they hope will lead to good jobs and a better future. “It’s our life,” he said, holding his Bachelors in Technology certificate. “Without this certificate, we are zero.”

Immokalee, Florida, U.S.

In September of 2017, Hurricane Irma dumped torrential rains on Immokalee, Florida, where most of the USA’s winter tomatoes are grown. Tomato pickers were displaced, fields were flooded for days and consequently the winter crop was delayed. Two months later, the shortage in tomatoes caused [retail prices to spike](#) as high as double across the country.

Wilson Perez is one of the people who pick the U.S.’ fresh-market tomato crop. That September, he and his four-year-old son, José, spent a week huddling in a local high school with hundreds of others until the floodwaters went down. In addition to the days of income lost to the hurricane — a significant loss for tomato pickers, who make minimum wage and pay high rents — José missed his first week of school and had to make it up later. Both Perez and his son got sick from the dirty water. “It’s been almost a year and we hope that another one doesn’t come,” said Mr. Perez in late August.

Makoko, Lagos waterfront, Nigeria

Aside from water, [climate change is increasingly flooding Lagos](#) with something else: garbage. The floods and the floating debris they bring is making it difficult for fisherfolk to navigate the waterways that lead to their traditional fishing waters. The majority of fishing families (81%) reported loss of income from floods; the [average income](#) dropped by as much as 50%.

As a young child, Dupe Oki, a fisherwoman in her forties, would accompany her father on fishing expeditions in his canoe. When she married, she used her father’s canoe to make a living from fishing. But today it sits idle most of the time, because debris from the flooding chokes the narrow waterways of her neighborhood and makes it impossible for her to get to the Lagos Lagoon. “Flooding interrupts our way of life,” she said. “It doesn’t allow us to go fishing as we have too much debris now on the waterways.”

Rio de Janeiro to São Paulo, Brazil

The stretch of Brazil’s coastline that runs between Rio de Janeiro and Brazil’s capital city of São Paulo is getting hit with torrential rains and sea level rise. In addition to the [homes and beaches](#) lost, many of the small businesses along the seafront have to rebuild every time a storm surge wipes them out. The city of São Paulo lost [an estimated \\$193 million](#) due to recent floods; the ripple effects caused the entire country to lose as much as \$1.4 billion.

Ana Beatriz De Fernandes owns the Mae Terra beachfront restaurant in Leblon, Rio de Janeiro. She lost about six months of revenue after the last storm surge, a phenomenon that is becoming more frequent as the sea level rises along the coast. “Every time we see clouds on the horizon we think ‘hopefully it’s not another big one,’” she said. “We don’t want to lose our livelihood.”

Beirut, Lebanon

Around [half a million people](#) leave Bangladesh every year in order to work abroad, mostly in Gulf countries like [Saudi Arabia and Qatar](#). Many of them are forced to migrate as a result of flooding in their native land. They are able to support their families—and Bangladesh’s economy, which

[depends heavily on remittances](#) — but their work is [difficult](#) and [often deadly](#). The average cost of migrating internationally is currently [\\$2,600 to \\$3,900](#), which amounts to three years' worth of income for the average Bangladeshi.

Nila grew up on the banks of the Jayanthi River in Southern Bangladesh. Nine years ago, the torrential downpours that accompanied Cyclone Alia destroyed Nila's home and killed her father. She migrated to Lebanon in order to support her family, which still struggles to survive chronic flooding. Now she works as a domestic laborer in Beirut. "I would not have come this far to a totally strange country had these misfortunes not befallen us," she said. "I would have completed my studies and I would have been around my family members."

Toronto, Canada

Five years ago, a severe rainstorm dumped [126 millimetres](#) of water on the city of Toronto in [just three hours](#). On August 7, 2018, it happened again, with 72 mm (2.8 inches) falling on downtown Toronto in just two hours. People whose houses were flooded in 2014 lost an average [seven days of work](#), costing them at least \$1,500 or up to 3% of their expected annual income.

Katherine Fera and her husband had to move out of their house for 12 days after flash floods inundated their basement this past August. Research shows that the psychological stress of flooding can last long after the event itself: three years after their houses were flooded, almost half the people in this study still felt anxious whenever it rained. "It is something I think about whenever it rains," Fera said. "The rain trauma is real."

Hamburg, Germany

In 1962, the River Elbe overflowed its banks and killed more than 300 people in Hamburg, the port city and shipping center in northern Germany. Since then, Hamburg has invested in a massive and improved system of levees around the city. In 2012, Hamburg's municipal government began to raise the height of the riverfront promenade from 7.2 metres to between 8.6 and 8.9 metres, in order to protect against the storms of the future. At US\$ 86 million, the project will be expensive—but cheaper than the destruction caused by continued floods. Public investment in reinforcing Hamburg's flood barriers totaled [\\$766 million from 1998 and 2015](#).

Jan Hübener has spent the past 12 years working on Hamburg's flood defenses, first at the [Zaha Hadid Architects](#) firm, which leads the project, and now as partner at studioH2K Architekten. "I think for a city like Hamburg, especially downtown Hamburg—for such a densely-populated area, with all the infrastructure, with subways and lots of office spaces—I think that it's not an option to accept flooding here," he said.

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