

## **Humanity has a ‘brief and rapidly closing window’ to avoid a hotter, deadly future, U.N. climate report says**

Latest IPCC report details escalating toll — but top scientists say the world still can choose a less catastrophic path

In the hotter and more hellish world humans are creating, parts of the planet could become unbearable in the not-so-distant future, a panel of the world’s foremost scientists warned Monday in an [exhaustive report](#) on the escalating toll of climate change.

Unchecked greenhouse gas emissions will raise sea levels several feet, swallowing small island nations and overwhelming even the world’s wealthiest coastal regions. Drought, heat, hunger and disaster may force millions of people from their homes. Coral reefs could vanish, along with a growing number of animal species. Disease-carrying insects would proliferate. Deaths — from malnutrition, extreme heat, pollution — will surge.

These are some of the grim projections detailed by the Intergovernmental Panel on Climate Change, a United Nations body dedicated to providing policymakers with regular assessments of the warming world.

Drawing on thousands of academic studies from around the globe, the sweeping analysis finds that climate change is already causing “dangerous and widespread disruption” to the natural world, as well as billions of people around the planet. Failure to curb pollution from fossil fuels and other human activities, it says, will condemn the world to a future that is both universally dangerous and deeply unequal.

Low-income countries, which generate only a tiny fraction of global emissions, will experience the vast majority of deaths and displacement from the worst-case warming scenarios, the IPCC warns. Yet these nations have the least capacity to adapt — a disparity that extends to even the basic research needed to understand looming risks.

“I have seen many scientific reports in my time, but nothing like this,” U.N. Secretary General António Guterres said in a statement. Noting the litany of devastating impacts that already are unfolding, he described the document as “an atlas of human suffering and a damning indictment of failed climate leadership.”

“This abdication of leadership is criminal,” Guterres added. “The world’s biggest polluters are guilty of arson of our only home.”

Yet if there is a glimmer of hope in the more than 3,500-page report, it is that the world still has a chance to choose a less catastrophic path. While some climate impacts are destined to worsen, the amount that Earth ultimately warms is not yet written in stone.

The report makes clear, however, that averting the worst-case scenarios will require nothing less than transformational change on a global scale.

The world will need to overhaul energy systems, redesign cities and revolutionize how humans grow food. Rather than reacting to climate disturbances after they happen, the IPCC says, communities must more aggressively adapt for the changes they know are coming. These investments could save trillions of dollars and millions of lives, but they have so far been in short supply.

The IPCC report is a warning letter to a world on the brink. The urgency and escalating toll of climate change has never been clearer, it says. Humanity can't afford to wait one more day to take action — otherwise we may miss the “brief and rapidly closing window of opportunity to secure a livable and sustainable future for all.”

### **Unavoidable upheavals**

Monday's report is the second of three installments in the IPCC's latest assessment for world leaders.

The first section, on the “physical science” of climate change, was published in August and provided a “code red for humanity,” Guterres said at the time, warning that people have already heated the planet at a startling pace.

Humanity has unleashed [more than a trillion tons of carbon dioxide](#) since the start of the Industrial Revolution, driving up global temperatures by more than a degree Celsius (1.8 degrees Fahrenheit). Combined with the effects of air and water pollution, habitat loss and widespread poverty, this unprecedented warming is wreaking havoc on natural and human systems alike, the report finds.

Already, climate change has caused the local disappearance of over 400 plant and animal species. Since 1945, warming-induced severe drought has killed up to 20 percent of trees in North America and parts of Africa.

Activities that drive climate change, primarily the burning of fossil fuels, doubled the area burned by wildfires in western North America between 1984 and 2017. In the oceans, warming has triggered “abrupt and often irreversible” melting of sea ice, bleaching of coral reefs and the demise of kelp forests, the IPCC report says.

Human communities also are dealing with increasingly deadly threats. One study of the world's 150 biggest cities found that these areas have seen a 500 percent increase in extreme heat since 1980. An average of 20 million people per year are forced from their homes by weather disasters as the warming atmosphere intensifies hurricanes, adds fuel to wildfires and heightens the risk of cataclysmic floods.

These escalating calamities are beginning to reverse decades of progress in agriculture, infrastructure and health — cutting into crop yields, damaging buildings and transit systems and incubating the microbes and insects that spread disease. Every year, roughly 40 million premature deaths can be attributed to malaria, cholera, heat stress and other climate-related illnesses.

“We are losing living spaces for species, and for ourselves as well, because with climate change, some parts of the planet will become uninhabitable,” Hans-Otto Pörtner, a German climate researcher and an IPCC co-chair, recently told reporters.

Within the next decade, global average temperatures could reach 1.5 degrees Celsius (2.7 degrees Fahrenheit) above preindustrial levels — a threshold scientists say is critical to avoid a series of irreversible changes. World leaders pledged in the 2015 Paris climate agreement to limit warming to “well below” 2 degrees Celsius (3.6 degrees Fahrenheit), with a goal of not exceeding 1.5 C.

Scientific studies have not identified a single point at which climate impacts go from catastrophic to civilization-ending. Instead, the IPCC warns, the risk of crossing certain “tipping points” increases as the world warms beyond 1.5 degrees Celsius.

Yet even if humanity musters the willpower to take drastic action, the world cannot avoid grappling with upheavals that are already underway.

By 2030, the number of children whose growth is stunted by malnutrition is projected to grow by at least half a million, the report finds. The glaciers of Mount Kilimanjaro will be completely gone in 2040. By the mid-century, between 31 million and 143 million people across Latin America, sub-Saharan Africa and South Asia could be displaced by weather extremes.

Some baked-in climate impacts will transpire no matter how vigorously the world cuts emissions and adapts to rising temperatures, the IPCC report says. This finding could bolster vulnerable communities’ calls for compensation to cope with the “[loss and damage](#)” that comes with inevitable change.

Nigerian climate activist Philip Jakpor, director of programs for the Lagos-based nonprofit Corporate Accountability and Public Participation Africa, said many Africans have endured tremendous losses caused by global warming.

Farmers have watched their croplands turn to desert. Coastal communities have seen their homes swallowed by the sea. Yet most African countries don’t have the funds needed to recover and rebuild.

Industrialized nations — whose wealth was created using the fossil fuel emissions now warming the planet — have a “historic responsibility” to assist, Jakpor said.

“They should pay for the damages from what they have unleashed on the world.”

## **A dangerous and unequal future**

A key aspect of Monday's report is global inequity, and how the basic unfairness of climate change crosses continents and spans generations. The more temperatures rise, the wider the chasm between rich and poor will probably become, and the harder it will be for all communities to withstand the intensifying costs.

"That's one of the clearest things the scientific evidence shows about the impacts of climate change — the injustice of it," said Saleemul Huq, director of the International Centre for Climate Change and Development in Bangladesh. "It affects poor people more than rich people, but it's caused by rich people's emissions."

Roughly 80 percent of those at risk of hunger in the worst-case warming scenarios will live in Asia and Africa. People in low- and middle-income countries, especially those in rural areas, are most likely to be displaced by extreme weather.

In Africa, which has generated less than 3 percent of the world's cumulative greenhouse gas emissions, people will endure a 118-fold increase in exposure to extreme heat if the world warms by 4 degrees Celsius (7.2 degrees Fahrenheit). By contrast, heat exposure in Europe — the source of one third of all planet-warming pollution — will go up just fourfold, the report finds.

"The differences in vulnerability around the globe are really striking," said Rachel Bezner Kerr, a professor of global development at Cornell University and a lead author of the IPCC report. "And it's not just between the global South and global North, but within countries."

Higher temperatures are linked to increased rates of violence against women and girls. People with disabilities are less able to evacuate from escalating natural disasters. Indigenous communities will suffer disproportionately as extinctions alter sacred landscapes and deplete traditional food sources.

The disparity is also intergenerational, scientists make clear. Most people currently in power will not live to see the most extreme consequences of continued emissions. It is today's children whose lives will be defined by the problems their parents failed to solve.

"I have so many emotions," said Farzana Faruk Jhumu, a 23-year-old Fridays for Future activist from Bangladesh. "Sometimes it's rage, and sometimes it's sadness. ... I try not to lose hope, but I'm not sure how much hope I have left."

Members of Jhumu's generation will see a fivefold increase in extreme events if the world warms 3 degrees Celsius (5.4 degrees Fahrenheit) by the end of the century, the IPCC reports. But under any warming scenario, people over the age of 55 — a demographic that includes the vast majority of world leaders and CEOs — will never endure such frequent catastrophes.

“They are making the decision of our life,” Jhumu said of older generations. “It’s disappointing they are not even seeing the future that is not that far away.”

So far, the world’s richest countries have failed to generate the pledged \$100 billion in annual funding to help developing countries build greener economies and deal with the intensifying catastrophes caused by climate change — a promise that was enshrined in the 2015 Paris climate accord.

Wealthy nations must make good on that broken pledge, while at the same time directing a greater share of funding toward adaptation, said Tina Stege, climate envoy for the Marshall Islands.

With sea levels rising at their fastest rates in more than 3,000 years, the low-lying atoll nation is bracing for saltwater contamination of aquifers, the loss of vital fisheries and near-constant floods. Stege said officials in the Marshall Islands have worked hard to develop adaptation plans, but like other resource-strained nations that did little to fuel climate change, it cannot shoulder the costs of worsening impacts without help from the outside world.

“We don’t have the ability to go it alone,” Stege said. “Honestly, no one else does.”

### **Time to transform**

The enormity of the world’s task to slow climate change was underscored by another escalating crisis this week, as Russian troops invaded Ukraine while representatives from 195 countries worked to finalize the IPCC report.

The head of the Ukrainian delegation, Svitlana Krakovska, continued to participate in the virtual meeting in recent days, even as bombs fell on her home city of Kyiv. The violence only underscored the dangers facing all people as the planet warms, she told an international gathering of negotiators over the weekend, according to two participants.

“Human-induced climate change and the war on Ukraine have the same roots: fossil fuels and our dependence on them,” Krakovska [said in an impassioned speech](#) Sunday. “We will not surrender in Ukraine. And we hope the world will not surrender in building a climate-resilient future.”

Whether people can achieve that future is an open question. But the Earth is destined to undergo a radical transformation in any scenario, the IPCC report makes clear. Either humans will change voluntarily — aggressively transitioning away from fossil fuels — or the planet will force a far more painful transformation.

Policies and pledges made at a key U.N. climate summit in Glasgow in November put global temperatures on track to rise between [2.5 degrees and 2.7 degrees Celsius](#) by the end of the century. This would yield a future

defined by suffering, one where rich and poor alike face increased deaths from extreme heat and disease, where populations fight over food and water and raging fires and rising seas make entire communities unfit for habitation.

Avoiding such catastrophe “would require substantial and sustained reductions of greenhouse gas emissions,” IPCC scientists wrote in August’s [installment](#).

Humanity has the tools to do so. Technologies that would allow the world to travel, produce energy and heat homes without polluting fuels have been invented. Social scientists have plotted out the policies needed to protect the environment while creating a safer world for people.

“The bottleneck for a sustainable future,” said Pörtner, the IPCC co-chair, “is political will.”

The IPCC authors detail how progress on adaptation “has been observed across all sectors and regions, generating multiple benefits.”

Despite the broken promises of the past, leaders of the world’s developed nations have promised to scale up funding that would allow cash-strapped, developing nations to adapt to climate threats and to create greener economies. Private-sector finance for climate action, including adaptation, has also grown substantially in recent years.

But Monday’s report is unequivocal that current adaptation efforts have been “uneven” and that “there are increasing gaps between action taken and what is needed to deal with increasing risks.” Too often, scientists say, the responses to rising seas, extreme heat and other problems have been reactive and small in scale, in contrast to the far-reaching measures that are warranted. One example: sea walls that actually increase the exposure of a low-lying area by allowing more intense development in the near term.

In many locations around the planet, the report says, the capacity for adaptation is already significantly limited. And as climate change worsens, humanity risks running into “hard limits” on its ability to cope. Tropical cities may experience temperatures and humidity levels too hot for the human body to tolerate. Droughts may become so intense that even crops that have been genetically modified to withstand water shortages will wither.

“The destruction and loss of life is not in the future; it is happening now, today,” said Chikondi Chabvuta, the Malawi-based Southern Africa advocacy leader for Care International.

That is why developed nations must drastically cut their emissions, direct more money toward adaptation, and live up to their climate finance promises, she said.

“It’s time to act,” Chabvuta added. “Otherwise, it’s a world for just a few, and the others are left off to perish.”