The new IPCC report's grim predictions, and why adaptation efforts are falling behind

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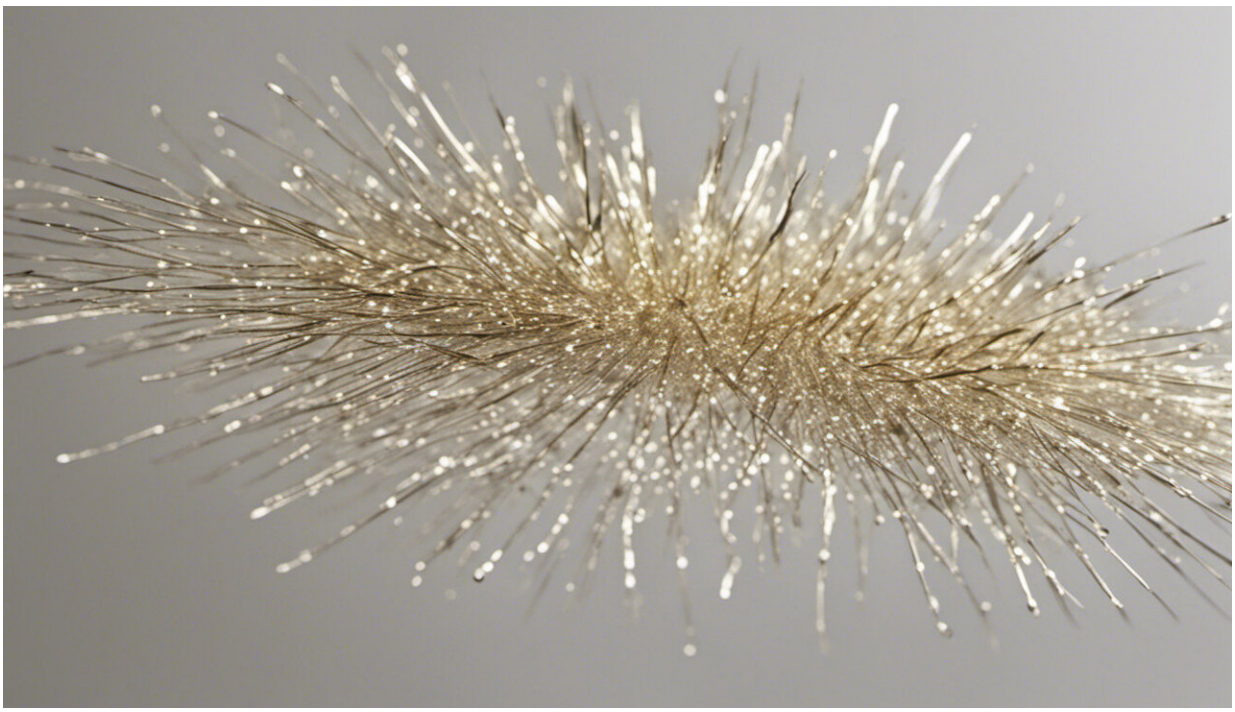

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Even if we manage to stop the planet warming beyond 1.5°C this century, we will still see profound impacts to billions of people on every continent and in every sector, and the window to adapt is narrowing quickly. These are among the disturbing findings of the latest report from the Intergovernmental Panel on Climate Change (IPCC).

At 1.5°C warming above pre-industrial levels, the new report projects that, for example, children under 12 will experience a fourfold increase in natural disasters in their lifetime, and up to 14% of all species assessed will likely face a very high risk of extinction. This is our best-case scenario.

Impacts such as these will not be evenly spread, with countries in Africa, Asia and low-lying island nations set to be hardest hit. Yet these nations are among the least able to adapt.

We are three vice-chairs of the IPCC, and helped guide the hundreds of scientists worldwide who authored this report. As the second in a set of three, this report gives the most up-to-date synthesis of what we know about the impacts of climate change, and how to adapt to them.

The previous report, published last year, confirmed Earth has already warmed by 1.09°C since pre-industrial times as a result of human activity.

Adaptation, such as through sustainable building development, can help humanity manage the increasing risks. But adaptation alone will not be enough, it must be paired with a drastic and urgent reduction in global greenhouse emissions if we're to avert the extraordinary crises that unmitigated planetary heating would bring.

Cascading climate crises

As the peak climate science body of the United Nations and the World Meteorological Organization, the IPCC is the global authority on climate change.

Our new report paints a worrying picture of climate impacts already affecting the lives of billions of people, our economies and the

environment, from the poles to the Equator and from the tops of mountains to the ocean floor.

> Scientists & govts are meeting to approve #IPCC's next #ClimateReport about what #climatechange means for people & nature.
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> IPCC's Debra Roberts explains how this process is critical to inform choices that shape our future.
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> Follow @IPCC_CH for the launch on 28 Feb at noon CET pic.twitter.com/8mJpRWhzdq
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> — IPCC (@IPCC_CH) February 26, 2022

Global warming of 1.09°C has already caused widespread impacts globally. In the past several years, we've seen enormous wildfires sweep across Australia, Chile, the United States and Greece. We've seen global, back-to-back mass coral bleaching events. And we've seen unprecedented heatwaves and cold events such as in British Columbia, Canada and in Texas, US.

Even if we manage to reduce global emissions and meet the Paris Agreement target of only temporarily exceeding 1.5°C this century, this could still have severe and potentially irreversible impacts, although less so than for higher temperature rises.

This includes species extinction, especially in low-lying islands and mountainous areas. Ice sheets will further break down in Greenland, West Antarctica and now even East Antarctica, raising global sea levels about half a meter or more by 2100.

Every small increase in warming will result in escalating losses and

damages across many systems. For example, the report found:

- under a high-emissions scenario (where global emissions continue unabated), more frequent and extreme disasters will lead to over 250,000 unnecessary deaths each year worldwide.
- up to 3 billion people are projected to experience chronic water scarcity due to droughts at 2°C warming, and up to 4 billion at 4°C warming, mostly across the subtropics to mid-latitudes
- projected flood damages may be up to two times higher at 2°C warming and up to 3.9 times higher at 3°C, when compared with damages at 1.5°C
- up to 18% of all those species assessed on land will be at high risk of extinction if the world warms 2°C by 2100. If the world warms up to 4°C, roughly every second plant or animal species assessed will be threatened
- even warming below 1.6°C will see 8% of today's farmland become climatically unsuitable for current activities by 2100.

Importantly, the interplay between these various impacts can potentially cascade into further risk.

Take Australia's 2019–20 bushfires as an example. Climate change exacerbated drought and heatwaves, which generated catastrophic fire conditions causing over 18 million hectares to burn.

The drought also reduced water availability for firefighting; the heat exhausted the firefighters in their protective clothing; and the fires generated their own fire weather, spreading the fire faster while also disrupting communications, power networks, and fuel and banking systems—all of which severely hampered the disaster response.

The fires also released huge amounts of carbon dioxide into the atmosphere, adding to warming and future fire risk.

Who will be hit hardest?

A key message from the report is how climate change increases inequities across the globe. Existing climate change impacts are already disproportionately hitting the poor and disadvantaged.

For example, reductions in food production have been greatest in those areas where poverty is already rife. This pattern is projected to worsen, with significant risk of large-scale food and nutrition insecurity.

Across Africa, for example, the report found climate change has already reduced agricultural productivity growth by 34% since 1961—more than any other region on the planet. Further warming will shorten growing seasons and the availability of water. In particular, warming above 2°C will result in significant yield reductions for staple crops across most of the continent.

By 2050, reduced fish harvests could leave up to 70 million people in Africa vulnerable to iron deficiencies, up to 188 million for vitamin A deficiencies, and 285 million for vitamin B12 and omega-3 fatty acids.

Climate change is also a dire threat to lives and livelihoods in small island nations, such as in the Caribbean and Pacific. For example, the report found warming above 1.5°C will see up to 90% of tropical coral reefs severely damaged. This jumps to 99% of coral reefs for warming over 2°C. Many rely on coral reef ecosystems for their livelihoods, and this will contribute to climate-related displacement, which is expected to increase.

And to rub salt into the wounds, developing nations, communities and people generally play only a negligible role in emitting the greenhouse gases driving the temperature up, with per capita emissions often only a tenth of those in developed nations.

Adapting isn't enough

To avoid the projected mounting losses, we require urgent, accelerated action to adapt to climate change.

There are adaptation options for every region and every sector. These could include removing houses and other infrastructure from floodplains to slow river flows and increase water retention, or improving building standards so our homes are suited to warmer climates.

But the more global warming that occurs, the fewer and less effective these options will likely be. Thus, as climate change proceeds, there will be ever-tightening limits on our capacity to adapt.

For example, in many subtropical and mid-latitude regions such as the Mediterranean, Chile and Mexico, hot temperature and drought conditions are likely to increase. Irrigation is obviously an adaptation option for high-value crops.

However, the likely lower water availability and increased demand across sectors will reduce water allocations, and constrain irrigation options. What's more, the efficiency of water use will reduce under hotter, dryer conditions with lower relative humidity of the air. This means for a given amount of water, there'll be less benefit to crop growth or even for other sectors, such as for cooling power stations.

Faster adaptation depends on getting the right support. We need firm political commitment and follow-through, robust institutions with diverse input, research and development which provides new adaptation options, and access to adequate financial resources.

Indeed, developed countries have agreed to mobilize US$100 billion per year to finance adaptation and mitigation in developing countries. But

while climate finance is increasing overall, it's not enough to enable adaptation to keep pace with climate change. Only a tiny fraction (an estimated 4–8%) is targeted at enhancing climate adaptation—most is aimed at emissions reduction.

Even a well-designed and implemented global adaptation program won't fully address the increased risks from climate change, and so losses and damages will likely mount. Action we take to adapt to climate change will require parallel reductions in greenhouse gas emissions—adaptation cannot do it all.

Where possible, adaptation actions should simultaneously reduce net emissions, and reduce climate risk. Clearly, adaptations that increase emissions—such as turning on our air-conditioners if they use fossil-fuel-generated electricity—are self-defeating.

Similarly, emission-reduction activities will increasingly need to adapt to the changing climate.

For example, higher temperatures and lower rainfall projected for southern Australia will lower the amount of carbon forests can soak up, because the forests' growth rate will reduce and more fires will lead to greater losses. Alongside enhanced fire management, choosing a mix of plant species that are adapted to a warmer climate could help offset some of these effects.

It's clear reducing global emissions alongside effective adaptation will put us on a trajectory of lower costs and damages. But at a global level, we're doing neither of these things to the necessary extent. We're at risk of missing a brief and rapidly closing window to secure an equitable and sustainable future.

Provided by The Conversation

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