



Adapting to Climate Change

By Bjørn Lomborg

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Striking the right balance between preventing global warming and adapting to its effects is one of the most important – and most vexing – policy questions of our age. It is also often ignored.

According to the conventional wisdom of many environmental campaigners, we should first do everything we can to mitigate global warming, and only then focus on adaptation strategies. This seems wrong – even immoral – if we could do more for people and the planet through adaptation.

Moreover, it is inconsistent with the inescapable fact that, whatever we do, we cannot prevent all of global warming's effects. If we are ill-prepared, global warming will cause more deaths and devastation, especially in poor countries and fragile societies. Adaptation would also mean saving many lives from catastrophes not related to global warming. If we prepare societies for more ferocious hurricanes in the future, for example, we are also helping them to cope better with today's extreme weather.

There has been a huge amount of research into the ways that humans cause climate change, and how we can reduce it. Much less work has been devoted to adaptation.

It is important to acknowledge that some adaptation strategies will lead to more greenhouse-gas emissions. Responding to water scarcity by re-using and treating wastewater, or through deep-well pumping and desalination, will increase fossil-fuel use. Using more air-conditioning to cool our houses in summer will do the same – although this is vital if we want to save lives. Adaptation could allow for higher carbon emissions in another way: reducing the damage and harm that we experience from

global warming, giving us more time to implement alternatives to reliance on fossil fuels.

Should any of this stop us from using adaptation strategies? To arrive at an informed answer, we need to work out how the planet will look in 2100 if we invest different amounts in adaptation and carbon cuts. We need to take into account the increase in emissions that adaptation will cause.

The most critical issue isn't any rise or fall in emissions. It is how much climate damage we can avoid. How much of the planet can we help by dealing with rising sea levels? How many lives can we spare from heat, starvation, or malaria?

These are the real reasons we care about global warming. Reaching a proper answer to these questions requires extensive economic modeling, with different variables calculated and regional differences analyzed. New research by three Italian economists, Francesco Bosello, Carlo Carraro, and Enrica De Cian does this, and, ultimately, provides a powerful economic case for a much greater focus on adaptation.

They first look at the different ways that climate change will affect us at mid-century. This work is based on standard scenarios, and carries the typical caveats of predictions far into the future. Nevertheless, they find that many of our biggest concerns will turn out to be trivial, or even beneficial.

Sea-level rises will be a very minor concern for every country, with the financial impact adding up to less than 0.1% of GDP. Health problems will be negligible for all but a few nations. And global warming's impact would reduce energy consumption for almost all nations.

The important effects are on agriculture and tourism, where nations will lose, on average, about 0.5% of GDP from each sector. But much of this damage will be avoided by people choosing for themselves to adapt to a change in their environment. Farmers will choose plants that thrive in heat. New houses will be designed to deal with warmer temperatures.

Simple economic models, often quoted in the media, show that unconstrained global warming would cost a substantial 2% of GDP in the rich world by the end of the century. But this fails to acknowledge that people will change their behavior when the environment changes. Taking adaptation into account, rich countries will adapt to the negative consequences of global warming and exploit the positive changes, creating a total **positive** effect of global warming worth about 0.1% of GDP.

Poor countries will be hit harder, however. Adaptation will reduce the climate change-related losses from 5% of GDP to slightly less than 3% – but this is still a significant impact. The real challenge of global warming, therefore, lies in tackling its impact on the Third World. Here, more needs to be done, above and beyond the adaptation that will happen naturally.

Importantly, the new research shows that adaptation would achieve a lot more than cuts in carbon emissions. Reducing emissions to a level that does not extinguish economic growth could avert \$3 trillion worth of damage, whereas adaptation could prevent around \$8 trillion worth of damage. For every dollar spent on adaptation, we would achieve about \$1.70 worth of positive changes for the planet.

The economic case for focusing more on adaptation is clear. The crucial next step is to ensure that economic arguments become a stronger part of our political debate about how to address global warming.

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