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The impacts of climate change on human wellbeing in developing countries

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Climate change is the central challenge facing the world today. With rising temperatures, increasing extreme weather events and other climate catastrophes, it is but essential to urgently usher in a green growth paradigm. In this piece, published in collaboration with [the International Growth Centre \(IGC\) blog](#), Nikita Sharma argues that Developing countries are set to face the brunt of the climate crisis and need international support to move towards sustainability without compromising on growth.

The consequences of climate change are all ubiquitous now. Floods, droughts, heatwaves, and other extreme weather events have seriously affected **over 1.3 billion people** between 2010 and 2019. Their frequency and intensity are still set to rise with increasing greenhouse gas emissions and changing climate.

However, these aggregate increases mask the spatial variations in the consequent instances of extreme weather events. The impact of climate change will be felt differently in various parts of the world. Estimates reveal around **338**

million people in India and 383 million people in China have been adversely impacted by floods and droughts in the last decade alone. Additionally, countries near the equator are likely to face greater instances and severity of the climate crisis.

A climate vulnerability index reveals an **overwhelmingly negative** relationship between a country's income and vulnerability to climate change. Almost **89 per cent** of the world's flood-exposed population is based in developing countries. Average flood losses in coastal cities are expected to worsen from **\$6 billion in 2005 to \$60 billion in 2050**. World Bank estimates **216 million will be forced to migrate** and 130 million will be further pushed into poverty because of climate change. The brunt of climate change's impact will unequivocally fall on developing countries that are not only facing increased environmental extremities but also lack the resources to withstand them.

Increased mortality with rising temperatures

Rising temperatures are inevitable. Given the current level of emissions, the world is expected to be warmer by 3°C by the turn of the century. In a project funded by the IGC, **Carleton and others** have calculated the economic costs from mortality due to rising temperatures, after also factoring in income growth and adaptation, to be upwards of 3.2 per cent of global GDP in 2100.

By analysing mortality-temperature relations from 40 countries for which data is available, they reveal a U-shaped relationship between temperature and mortality – deaths increase both under very hot and cold temperatures – and extrapolate their analysis to developing countries (for which data is often unavailable) and show how today's poor and hot countries are projected to suffer the most **damages** and how the effects of climate change here have been so far mostly underestimated. They predict the mortality risk of climate change under high-emissions scenarios and find it similar in magnitude to the global mortality burden of all cancerous or infectious diseases.

Notably, they show how this mortality burden is spread disproportionately across the world. For instance, they estimate the mortality rate in Accra, Ghana to rise by 17 per cent with an increase in very hot days, whereas in Berlin, Germany, the mortality rate is projected to decrease by 15 per cent because of milder winters, under a high-emissions scenario by the end of the century.

The social cost of growing energy needs

To regulate the growing extremes of temperatures, people's obvious recourse is to rely on technology to regulate it – more air conditioning to cool on hot days and more heating to warm on cold days – and invariably, increase the emissions of greenhouse gas emissions in the atmosphere. Improving technology and production processes have reduced costs and made affording ACs and heaters easier, especially in developing countries. In their IGC-funded research, **Rode and others** have predicted a drastic increase in energy needs from electricity in emerging economies such as India, Indonesia, and Vietnam. They further reflect that climate change will have the most impact on the energy needs of developing countries which will have even greater demands for cooling.

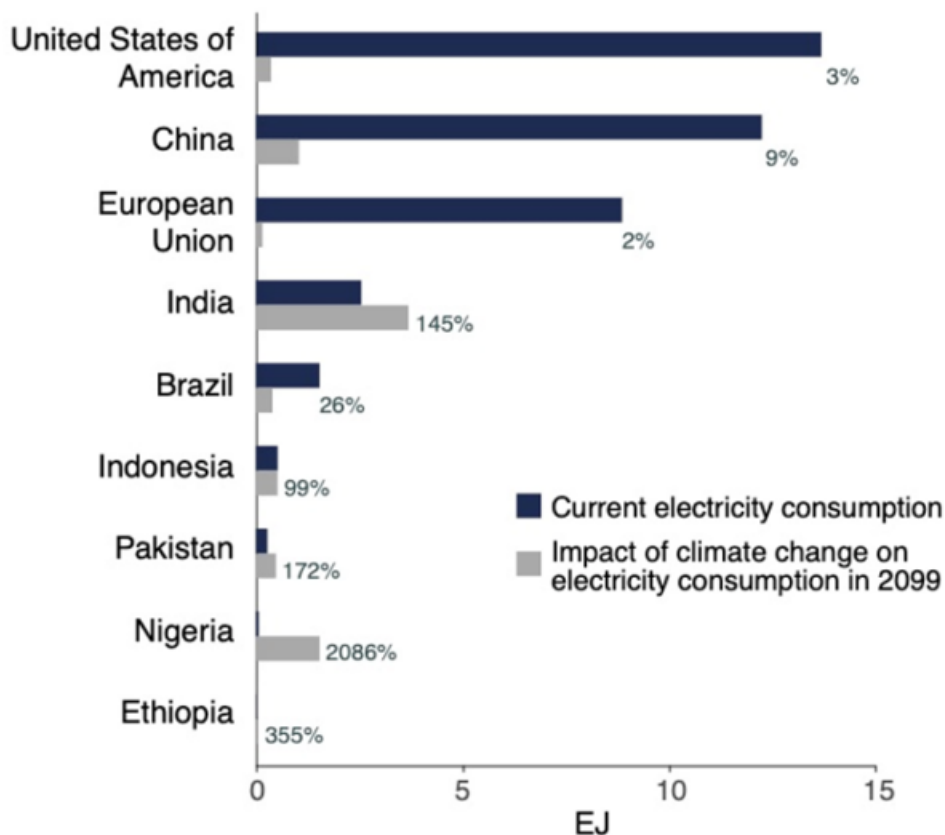


Figure 1: Projected impact of climate change on electricity consumption (% of current consumption). Source: Rode et al., 2021

They conceptualise the social cost of carbon – *the monetary value of the damages imposed by the release of one additional ton of carbon dioxide or the benefit of mitigating one ton of emissions* – which they place at the heart of assessing cost-effectiveness of climate mitigation policies (and been employed by the **US government** in its estimates). Per their present calculations (which is still being refined to account for impact from a range of other channels), an

additional ton of CO₂ in the atmosphere is worth US\$ 189. Their estimates suggest by 2099 the annual global electricity consumption would rise by 7 per cent of the present global consumption. Developing countries which are still early on in their growth trajectories can be expected to contribute the bulk of the increase in electricity demand to fuel their growth. This makes the transition of developing countries to sustainable growth paths crucial.

Potential for greener growth

Arguably, the best setting to solve the climate challenge is in a borderless world. Even though different parts of the world are affected differently by the climate crisis, international coordination and effort are crucial for mitigating climate change. This includes but is not limited to, making climate finance accessible for affected countries smoothly and substantially so that they can provide essential aid and support to their populations hit by environmental extremities, adapt to their growing intensity and frequency, and build resilience into their systems.

Staunching emissions from electricity generation to protect the environment doesn't necessarily mean staunching growth. New and affordable technologies such as solar energy have increasingly made a **green growth paradigm** within reach. Just as the use of mobile phones exploded in the early 2000s in developing countries, with necessary technological and financial support, developing countries can still rapidly adopt greener technologies for electricity generation, and open possibilities for new **green jobs**. This can usher in structural transformation – the move of employment from agriculture to manufacturing and services – which is essential to the growth process and will better absorb the largely young populations of developing countries.

The importance of structural transformation becomes even more pressing as productivity in the agricultural sector is set to decrease because of climate change – erratic weather conditions such as floods and droughts harm crop yields – and the sector is in crucial need of **adapting and being resilient to climate change**. Better seeds that are resistant to and resilient against pests and droughts and improving water access and mechanisation to make marginal areas arable are few of the interventions needed. As people move out of agriculture, **cities** will have to adapt to absorb these populations meaningfully and grow their physical and institutional infrastructure to sustainably provide

social protection and employment. Investments in housing and setting up job search and matching initiatives can be potential first steps for preventing local public service infrastructure from being overwhelmed by the added load of climate-related migration.

Beyond cities, at the macroeconomic level, governments need to regulate markets and emissions, and orient incentives for production and investment in green technologies and services. Information underpins all climate mitigation and adaptation efforts. Just as the social cost of carbon offers a tangible means of thinking about the climate consequences of carbon emissions and weigh trade-offs, information about the levels of pollution or new green technology can inform people's choices about migrating, employing new technology, or investing in building new skills. Our lives are now firmly entwined with the challenge of climate change and all our actions will determine and must be determined by its effects on human wellbeing.

To learn more about estimating the impact of the climate change on human wellbeing watch the event recording [here](#) and read IGC's latest growth brief on [sustainable growth for a changing climate](#).

Photo by Natalie Dmay: <https://www.pexels.com/>

About the author



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Nikita Sharma is the Economics Editor for the IGC and oversees IGC publications, including the IGC blog. Straddling research and communications, she has also been the Managing Editor for VoxDev.

Previously, she has also worked as a research assistant at the Massachusetts Institute of Technology. She holds an M.A. in International and Development Economics from Yale University and a B.A. in Economics from Miranda House, University of Delhi.