Climate change is real, so are its costs

Photo: AP

Recent research has found that temperature risks have a negative effect on wealth, especially in forward-looking markets such as stocks

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After two back-to-back drought years, 2016 has witnessed massive floods in many parts of the country. While it is easy to dismiss such calamities as natural disasters, the increasing frequency and intensity of such events over the past few

Tsiang, Bala Rajaratnam and Noah S. Diffenbaugh from the University of Stanford studied monsoon patterns for India from 1951 to 2011. The time-frame was divided into two sub-periods: 1951-1980 and 1981-2011.

The paper says that mean July-August rainfall shows a significant decreasing trend since 1951, even as the daily rainfall variability increased. What this means is while total rainfall has been coming down, it has become far more volatile.

The paper notes a shift in recent periods towards more intense wet spells and more frequent but less intense dry spells. While sudden heavy rains cause a lot of inconvenience to commuters in cities, this is not the only problem they bring.

Such rains do little to meet agricultural requirements as farmers might suffer when it does not rain during critical sowing period and rains a lot later in bursts, often with devastating consequences for crops. Gradual rains are also more efficient in groundwater recharge.

The authors are unambiguous in raising the red flag: "Given the heavy dependence of agriculture on rainfall and the acute human vulnerability to flood events, the increases in dry spell frequency and wet spell intensity identified in our results represent increasing climate-related risks in the Indian subcontinent. Rapid population growth and land-use change combined with groundwater depletion suggest simultaneously increasing exposure and vulnerability to these events."

India is not the only one experiencing hardships due to climate change. As a recent *Washington Post* report pointed out, West Asia is experiencing unprecedented heatwave conditions, which entail short-term costs such as people getting sunstroke or not being able to work during the day time, as well as more longer-term effects such as growing civic unrest due to inefficient handling of droughts and eventually pose a threat to human habitation in some parts of this region.

The latter findings are based on a joint scientific study by researchers at the Max Planck Institute for Chemistry in Germany and Cyprus Institute in Nicosia. This study predicts that North Africa, which is one of the hottest regions in the world,

keeping global warming under the 2 degrees Celsius level, such regions could witness situations where night temperatures remain above 30 degrees Celsius, and midday temperatures close to 50 degrees Celsius by the end of the century, and heatwaves increasing by up to 10 times. Such events are likely to trigger a massive migration from these regions.

What is the point of discussing these disconcerting scientific findings in a column on economics? An earlier *Economics Express* column, written ahead of last December's Paris climate summit, had discussed how disagreements on what is an appropriate discount rate (of future consumption against the present) have been the root of clashes on strategies to mitigate climate change.

The reason why discount rates are important in climate change negotiations is because it is generally believed that the ill effects of failing to prevent global warming would have to be borne by future generations and strategies to mitigate such changes would have to be paid for by the current generation.

Thus, any calculation of mitigation costs would require one to make assumptions about the trade-off between present consumption and future consumption, and hence discount rates.

The studies cited in previous paragraphs suggest that the ill effects of climate change are no longer just in the realm of the distant future, but have started appearing in the present times. Thus, all costs may not be inter-generational in nature, but could very well be intra-generational for millions of people across the globe.

Often, it is assumed that agricultural activities will suffer because of climate change, but climate change poses other risks as well. The actual picture could be much worse.

A 2008 report prepared by National Resources Defense Council—a US non-profit environmental organization—had estimated that climate change-related losses would account for 1.36% of US gross domestic product by 2025. It expected the figure to go up to 1.84% by 2100. In absolute terms, the 2025 loss was estimated at $271 billion (in constant 2006 US dollars).

Apart from warm sea conditions producing more hurricanes, and rising sea levels inundating low-lying properties, increasing demand for air-conditioning and refrigeration, even in currently colder regions, and drought conditions increasing demand for water are expected to impose significant costs on the US economy.

Climate change may also exacerbate human conflict in the future. A 2014 National Bureau of Economic Research (NBER) paper, by Marshall Burke of Stanford University and Edward Miguel and Solomon M. Hsiang of the University of California, Berkeley, has looked at 55 studies examining the relation between conflict—both interpersonal and intergroup—and climate change.

The study of relation between climate and conflict in the field of economics is a relatively new phenomenon. The authors note that the median year of publication of the 55 works studied in the paper is 2012.

The meta-analysis by the authors of the NBER paper suggests that the median effect of a one standard deviation change in climate variables is a 14% change in the risk of intergroup conflict and a 4% change in interpersonal violence.

While the idea of using econometric analysis to predict an increase in domestic violence due to global warming might seem a bit far-fetched currently, the paper reminds the readers that it was statistical analyses which first pointed towards the link between smoking and incidence of cancer, whereas the exact mechanism took more time to become clear.

Another 2016 NBER paper has found that temperature risks have a negative effect on wealth, especially in forward-looking markets such as stocks. The authors attribute it to the fact that even if the cost of climate change does not arise in the present, its possibility in the future can lower the future valuation of wealth. The paper, which has looked at data for 39 countries, finds that the premium for climate change-related costs have been increasing in equity markets.

A large amount of financial resources would be required to mitigate climate change effects. This situation has been further complicated by the asymmetry between incentives to change and the resources for change.

constrained for resources.

Given this imbalance, many countries whose interests would be hurt by climate change mitigation efforts have been trying to negate the reality of climate change or coming up with tenuous logic (such as future economic growth would take care of the costs of climate change, and so present generations need not sacrifice anything) to avoid a meaningful discussion on adaptation and mitigation strategies.

Republican presidential candidate Donald Trump has been talking about building a wall between the US and Mexico and preventing the entry of Muslims into the US. Even if these ideas were to turn into reality, they would be unlikely to insulate the US from tumultuous developments in global geopolitics and economy.

If climate change were to dramatically alter agricultural production, inundate cities, create a spike in demand for energy and, worst of all, force people to migrate from their homes, the consequences would be too large for anybody to remain insulated. The signs of this are already beginning to appear across the globe.

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