

Researcher discusses how environment affects the way societies develop

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In interview, Asst. Prof. Amir Jina explains how climate change affects local economies, from the U.S. to places like Bangladesh. Credit: Amir Jina

This is the latest in a series of stories spotlighting how faculty, students and alumni at the Harris School of Public Policy are driving impact for the next generation. Leading up to the May 3 grand opening of the Harris's new home at the Keller Center, these stories will examine three of the most critical issues facing our world: strengthening democracy,

fighting poverty and inequality, and confronting the global energy challenge.

Delivering access to reliable and affordable energy, while minimizing its social and environmental impacts, including those created by our [changing climate](#), is one of society's most complex challenges.

Asst. Prof. Amir Jina focuses his research on the role of the environment and [environmental change](#) in the shaping how societies develop. He combines methods from climate science and remote sensing to understand the impacts of climate in both rich and [poor countries](#).

A founding member of the Climate Impact Lab—an interdisciplinary collaboration examining the socioeconomic impacts of climate change around the world—recently with Harris Public Policy to discuss his work.

Talk a little about climate change's significance beyond environmental impact.

We are at a stage with the science and knowledge that most of the details about climate change are broadly known. There are many nuances—for example, how will disaster risk change or what parts of the planet will warm at faster rates—but we basically understand that the planet is warming, and we are now investing in the research and technology to mitigate and manage that.

The socioeconomic side of the issue, however, is less understood. What I'm trying to do—with the help of other economic and climate experts from across the country—is build a foundation of evidence and use [relevant data](#) to understand the relationship between climate and society. The effects of heat on worker productivity or suicide surges following

crop losses or increases in crime and incarceration rates, for instance. There are countless impacts that can be uncovered, quantified and used strategically to inform development and investment.

Are there specific regions of the U.S. that should brace themselves more for economic hardship than others as a result of climate change?

One of the most surprising findings our research uncovered was the significant regional disparities in terms of responding and adapting to the effects of climate change. We know that places with lower average incomes are suffering more than their affluent neighbors and because U.S. counties in the South are, on average, poorer than counties in the North, their ability to manage the [impact](#) of climate change is tenuous. The fact that they face hotter temperatures on a more regular basis further exacerbates risk. In the North, rising temperatures are positive for things like [better health](#). In the South, enhanced hurricanes and rising sea level caused by a hotter climate creates a perfect storm from which these communities may not be able to recover.

And what about the impact of climate change globally? Especially in poorer countries, like India?

This one is hard—the richness of data that is available in wealthy countries is often not there in poorer ones. To understand the true impact, we had to think about how to capture data on a majority of countries who are the poorest and most vulnerable. We began to see a very similar pattern to what we found in the U.S.—that poorer countries, especially tropical countries, fared much worse than wealthier countries who were able to invest in adaptation, like purchasing air conditioning or having better health infrastructure—things which have the effect of mitigating the negative impacts of climate change on the economy.



In India, a farmer clears land of weeds, which grow better than the crops people plant due to the erratic rainfall. Credit: Amir Jina

How are losses due to climate change calculated? And why are these numbers important for the everyday citizen?

It starts with data, both on economic outcomes and on climate variables. But it's not easy to do, as different places have very different environments, social structures, policies and so on. So we zoom in a bit, and examine data from a particular location, running statistical models that compare years with more extremely hot or cold days and years with fewer, for instance. We look at how heat impacts health, the ability to work, food security, energy demand, and other outcomes for thousands of locations across the globe. That's how we end up with estimates of the relationships between climate and the economy.

On days when it's hotter, we may see a rise in mortality rates or a decline in crop yields. We can analyze these outcomes to better understand how the relationship between a variety of inputs—from the loss of crops or the health of workers—and climate evolves over time. Then we project these into the future, building on cutting-edge [climate science](#), and taking into account how much people can adapt. To be able to compare, say, health and agriculture, we assign dollar values to their impacts. This gives policymakers, employers, and investors critical information for designing tools and programs that best address and prepare for what's really happening on the ground because of climate change. And one thing becomes very clear: the longer we wait to enact policies that will delay climate change, the more expensive it will become to cope with its effects down the road.

Beyond economic impact, what types of social challenges do we face?

Climate change is a threat multiplier. We see a strong correlation between climate and conflict. In places where resources are scarce, political systems are unstable and cultural rifts exist; for example, climate change comes in and exacerbates all of that. We look a lot at crime and the rise in crime rates—from theft to homicide—that occur due to environmental exposures. This could become a major issue for countries as they evaluate how important climate change policies are and what level of response is necessary to ensure the safety and security of their citizens. It's not just about dollars, but also about our sense of safety.

How significant is it that the U.S. has said it will leave the Paris Accord and what are the consequences you see as a result?

Broadly speaking, climate change is among the greatest challenges our society has ever faced. Other things might be more costly, but I can't think of anything as thorny as climate change—its causes and effects are often distant in space and time, affecting people all over the globe, and it requires unprecedented global coordination to deal with it. When you turn on your fossil fuel light switch, you are causing harm in other places of the world. To be a robust, healthy society, however, we need a lot of energy. But, there is only a limited amount of space left in the atmosphere for fossil fuels emissions—so who gets to use that space? That's a big ethical question and any response must be considered in a global context.

The Paris Accord was a good start. It made a statement that almost the whole world—including the U.S., which isn't the world's largest emitter now but historically has been—was committed to the issue. The last few years have changed that—the U.S. saying it doesn't care anymore is extremely detrimental. We tried for decades to have this international agreement, and the U.S. has a unique role in leading the world on this set of issues. Unfortunately, shortly after the U.S. embraced that leadership role, we backed out, in effect sending the message that climate change is an optional problem to deal with, and it's anything but.

Do you think there are specific policies that could help mitigate the negative effects of climate change?

There is nearly unanimous consensus among economists about what we should do: put a price on carbon. It's an attractive idea because fossil fuels have had an unfair advantage for 250 years—with the costs of the external impacts on people not being paid by either the users of fossil fuels or by the extractors.

Each time we use [fossil fuels](#) we cause damage somewhere, but no one

pays for them. So accurately pricing those would allow us to equalize the playing field. But, as we've seen, it's a politically contentious policy. People see it as overly expensive when they only look at the costs of the policy and so, for many, it's a non-starter. We are now starting, however, to understand that the benefits in reducing damages may be enormous, and far outweigh the costs of any climate policy.

As we consider policies, however, two things must be incorporated in the process. First, we must ensure that any policy making is done according to the best available science; and second, we need to focus on equity. Benefits should not just accrue to certain people in society. We need to account for the fact that these [climate](#) impacts are affecting poorer people and nations more significantly than wealthier ones.

Provided by University of Chicago

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