

**Speaker:****Esha Zaveri (World Bank)****Date and Time:**November 02<sup>nd</sup>, 2023 (Thursday); 3:00 PM**Venue:**

Econometrics lab (room no 402), Fourth floor,  
Department of Economics, Rahul Bajaj Technology  
Innovation Centre

**Title:****Droughts and Deficits: Unlocking the Potential of Green Water****Abstract:**

As climate change intensifies, dry rainfall shocks and droughts are a growing concern. At the same time, scientific evidence suggests that the world has surpassed the safe planetary boundary for green water, which is water stored in biomass and soil that is crucial for maintaining climate resilience. Yet, evidence at the global scale of these combined forces on economic growth is poorly understood. This paper attempts to fill this gap by using data on annual subnational gross domestic product for 82 countries from 1990–2014.

Using rainfall shocks as plausibly exogenous variations in a spatially specific panel at the grid level, the analysis finds that the global effects of droughts on economic activity are substantial. Moderate to extreme droughts reduce gross domestic product per capita growth between 0.39 and 0.85 percentage point, on average, depending on the level of development and baseline climatic conditions, with low- and middle-income countries in arid areas sustaining the highest relative losses. In high-income countries, moderate droughts have no impact, and only extreme droughts have adverse effects, reducing growth by about 0.3 percentage point, a little less than half the impact felt in the low- and middle-income country sample for the same intensity of drought. Crucially, the impact of a dry shock of a given magnitude also depends on antecedent green water availability. The results show that increases in soil moisture in previous years can neutralize the harmful impacts from a dry shock, with suggestive evidence that local and upstream forest cover are key channels through which these impacts manifest. These findings have important implications for measuring the economic impact of droughts and can inform adaptation investments.

**About the speaker:**

Esha Zaveri is a Senior Economist in the Office of the Chief Economist of the Sustainable Development Practice at the World Bank. Prior to this, she was a senior economist at the World Bank's Water Global Practice and a member of the Water, Economics, and Climate Change Global Solutions Group. Her work centers around water resource management, climate impacts, and environmental health and spans from global to region- and country-level assessments in Asia, Africa, and the Middle East. She has published on these topics in leading scientific journals and has authored flagship reports of the World Bank on water scarcity (Uncharted Waters, 2017), water pollution (Quality Unknown, 2019), environmentally harmful subsidies (Detox Development, 2023), and droughts (Droughts and Deficits, 2023), and has led and authored a flagship report on water, migration, and development (Ebb and Flow, 2021) and more recently on the economics of groundwater in times of climate change (The Hidden Wealth of Nations, 2023). Before joining the World Bank, she was a postdoctoral fellow at Stanford University's Center on Food Security and the Environment, where she remains an affiliated scholar. She holds a Ph.D. in Environmental Economics and Demography from Pennsylvania State University.