

## **Diagnosing impacts of climatic disasters on the global wheat network system: How do shocks propagate from a country to the globe?**

**Shah, Kasturi**

Research Assistant / incoming PhD student, Columbia University / Massachusetts Institute of Technology, United States, ip2235@columbia.edu

Crop yields impacted by climate extremes, however, there is insufficient understanding about how this impacts food production, food price and global trade network system. In this research we focus on wheat as it is the world's most grown crop and a critical staple food crop. Using publicly available datasets, we analyse and visualize impacts of climate-related disasters in three stages: a diagnostic analysis of agri-economic factors in the top wheat exporting/producing countries and their importers confirms some of the key impacts. This helps us understand the inherent risk of disasters in wheat growing regions and their effects on export/import volume, stock changes, price and production. Our findings confirm that, in particular, trade volume and price is affected in Argentina, the Russian Federation, Turkey, the UK and the Ukraine in the climate disaster years. In the second stage, we diagnose rippled impacts of disasters using a multiple linear regression as well as structural equation modelling framework for individual selected country groups. In the third stage, a comprehensive analysis of the global wheat trade network confirms that most countries import wheat from at least two top producing countries as a possible risk management strategy. In order to reduce damage caused to the wheat network under extreme climate shocks, countries must have trade links selected ingeniously to buffer negative impacts on their agricultural production and economy.