HIGHLIGHTS from Spotlight 1:
HEAT AND FLOODS IN SOUTH ASIA: HOUSEHOLD AND FIRM EXPOSURE

Key Points

- *South Asia faces rising exposure to extreme heat and flooding, and some groups are more exposed than others.*
- *Poorer households experience more heat than better-off ones. In urban areas, poorer households also experience more recurrent flooding.*
- *Using India as a case study, smaller firms are more exposed to both heat and flooding.*
- *Information on the location of the most climate-affected people can be one of the inputs into targeting mechanisms for social protection systems that can readily respond to climate and other shocks.*

South Asia's vulnerability to extreme heat and flooding. The expected rise in temperature due to climate change has particularly adverse implications for South Asia—a region where the average maximum temperature is already about 6 degrees Celsius higher than in other emerging market and developing economy (EMDE) regions. Similarly, flooding is a major climate-related hazard in South Asia, with an above-average share of its land area being flood-prone. While the number of deaths from floods has declined over the past decade, the number of deaths from extreme temperatures has risen.

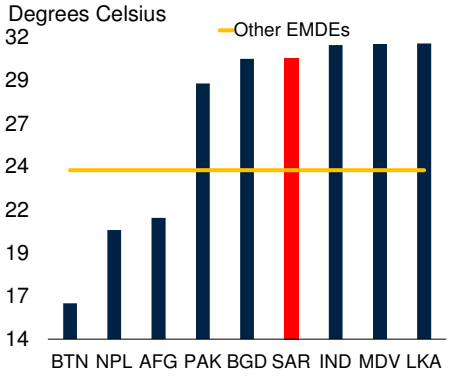
Unequal household exposure to heat and floods. South Asian households with lower wealth are more exposed to higher temperatures than are better-off households, in both urban and rural areas. For example, in urban South Asia, the wealth gap between locations at temperatures of 29 and 34 degrees Celsius is equivalent to 40 percent of the wealth gap between urban and rural areas. In urban areas, locations with a higher incidence of flooding between 2000 and 2018 have lower wealth. These findings are consistent with residential sorting, where richer households are more likely to reside away from locations with heat and flood risks.

Unequal firm exposure to heat and floods. Within Indian states, hotter places have smaller firms. Firms in places with average temperatures at 31 degrees Celsius are 12.5 percent larger than firms in places with average temperatures of 33 degrees Celsius. Smaller firms are also more exposed to flooding in both urban and rural India. These findings are consistent with productivity loss due to climate shocks.

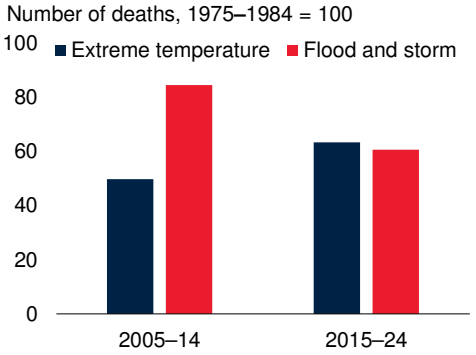
Policy implications. These disparities suggest the need to remove obstacles to relocation, especially for the poor, and to spur firm growth. Information on the location of the most climate-affected people can be one of the inputs into targeting mechanisms for social protection systems that can readily respond to shocks. Addressing constraints to non-agricultural firm growth in highly exposed locations would not only generate better jobs for the poor but also reduce their vulnerability to climate shocks.

FIGURE 1. Household and firm exposure to heat and flooding

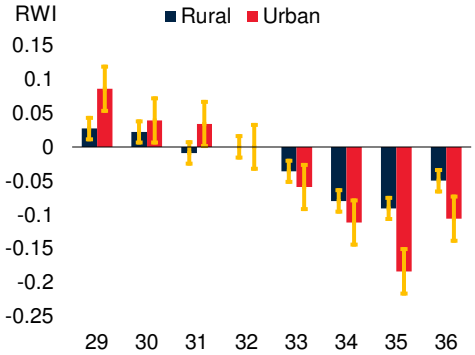
A. South Asia's average temperature



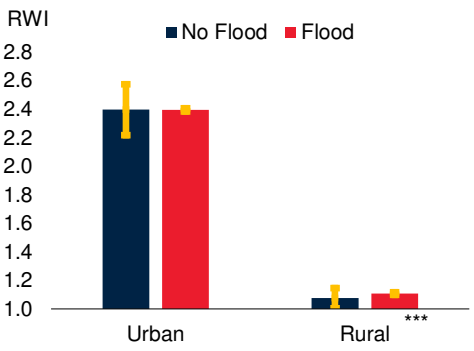
B. South Asia: Death by event type



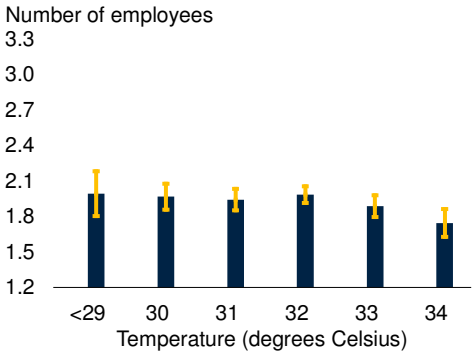
C. Average relative wealth by temperature



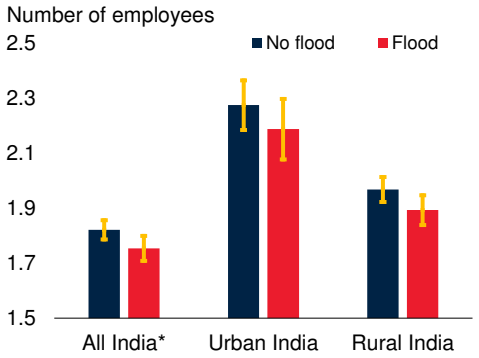
D. Average relative wealth by flooding



E. Average firm size by temperature



F. Average firm size by flooding



Sources: EM-DAT (International Disaster database); ERA5-Land database; Dartmouth Flood Observatory; Relative Wealth Index; Economic Census of India 2013; World Bank. Global Flood Database; Macro Poverty Outlook (World Bank); Notre Dame-GAIN Index; Poverty and Inequality (World Bank database); World Bank.
Note: RWI refers to the Relative Wealth Index (Chi et al. 2022).
A. Chart shows the average maximum daily temperature between 2017 and 2021. "Other EMDEs" are EMDEs excluding SAR countries.
B. Chart shows the number of deaths due to extreme temperature events and flood and storm events from 2005–14 and 2015–24. Numbers are indexed to 100 in the period 1975–84.
C. OLS regression coefficients showing the relationship between relative wealth and temperature in urban and rural areas. Temperature bins (in degrees Celsius) on the X-axis. Relative wealth, measured by the RWI, on the Y-axis.

The bars indicate the mean Relative Wealth Index estimate for a given temperature bin. Whiskers indicate 95 percent confidence intervals. State fixed effects included. Standard errors are clustered at the district level.

D. Linear regression coefficients showing average relative wealth as measured by the RWI (Y-axis) versus a binary indicator that takes the value of one if a location was ever flooded between 2000 and 2018 (X-axis). State fixed effects are included. Standard errors are clustered at the district level. Whiskers indicate 95 percent confidence intervals.

E. OLS regression coefficients showing the relationship between average private firm size and temperature. Firm size (Y-axis) is measured by the number of employees. Temperature bins (in degrees Celsius) shown on the X-axis. Each bar depicts the mean estimated firm size in a given temperature bin. Whiskers indicate 95 percent confidence intervals. The regressions include state fixed effects. Standard errors are clustered at the district level.

F. OLS regression coefficients showing average firm size versus a binary indicator that takes the value one if a location is ever flooded between 2000 and 2018. Standard errors are clustered at the district level. Whiskers indicate 95 percent confidence intervals.