A warming climate will impact society in a number of different ways, such as gradual changes and extreme events, across different sectors, such as water, energy, land, infrastructure and coasts. Increasingly, assessments have sought to identify hotspots of climate impacts, locations where multiple impacts can be expected. And by using socioeconomic measures, incorporating vulnerability enables assessments to identify hotspots of climate risk.

A key finding and recommendation of the recent IIASA hotspots assessment was that delivering socioeconomic development, targeted in climate hotspots with vulnerable people, was the most effective measure for reducing risks for potentially hundreds of millions of people.

We find that locations in South Asia, including India, Pakistan, and Bangladesh, many in Africa, including Nigeria, top the charts for locations where socioeconomic development that reduces vulnerability has the greatest potential to deliver risk reduction for populations exposed to hazards in multiple sectors.

Building upon our original analysis, this analysis identifies the key locations (and countries) where sustainable socioeconomic development (e.g. SSP1) is likely most effective for reducing risks. Furthermore, we can show for each country how the uncertainty across socioeconomic development scenarios (SSPs1-3) compares to the climate scenario uncertainty (1.5 vs 3.0 °C) or the climate model uncertainty.

In addition to this scenario uncertainty analysis, we use the hotspots framework to identify for selected countries the key sectors and climate hazards that contribute to high risks in these locations. For example, in China and Turkey, exposure is dominated by land-water impacts, whereas in most southeast Asian countries, exposure is more driven by land-energy challenges (even if water-related challenges still exist). For South Asian, and West and East African countries, reducing vulnerability to heat stress events, and for the latter two reducing vulnerability to water stress and agricultural pollution from nitrate leaching are effective, potentially affecting 1-2 billion. Similarly, in the Mediterranean and across most of Asia, unsustainable use of groundwater, water stress and excessive agricultural water demands all correlate.

Building on our previous regionally aggregated assessments, this decomposition at the country level, through sectors and indicators will provide targeted information (with associated climate and scenario uncertainties) to assist adaptation planners and development funders prioritize activities for climate-resilient development.