

## **Vulnerability of Indian Agriculture to Climate Change and Globalization**

*H. Tompkins*

Centre for International Climate and Environmental Research (CICERO), Oslo,  
Norway

heather.tompkins@cicero.uio.no

India's vulnerability to climate change is widely recognized. It lies in an area characterized by seasonal weather patterns, and experiences land degradation, rapid economic development, and an increasing population. Since over 70% of India's population relies on agriculture for their livelihood and sustenance, most of the research focus has been on how India's agriculture might be affected by climate change. However, the concentration of research on climate change impacts fails to recognize that there are other complex global processes at work, such as globalization, which may influence or exacerbate the situation.

The goal of this project is to examine the vulnerability of India's agriculture within the context of both climate change and globalization. In the last decade there have been significant changes in India's economy as it moves towards liberalization. These changes will arguably alter India's vulnerability, creating a different set of winners and losers in the climate change game. The multifaceted approach of this project attempts to capture the differing sources of vulnerability by incorporating the concept of "double exposure", which refers "to the fact that certain regions, sectors, ecosystems and social groups will be confronted by the impacts of climate change and by the consequences of globalization" (O'Brien and Leichenko, 2000). Another key component of the project is the recognition that climate change and globalization are dynamic processes. Accordingly, one may assume the impacts of global process will change over time as well, altering the location, type and severity of vulnerability.

The project consists of four parts:

- 1) A macro-level vulnerability analysis, based on GIS,
- 2) A domestic policy analysis,
- 3) A micro-level analysis (including village-level case studies in four different agricultural regions) and,
- 4) An integrated analysis that will synthesize the preceding work and offer policy recommendations for facilitating adaptation in the agricultural sector.

The poster will illustrate the results from the macro-level analysis, which involves the mapping of vulnerability profiles. These profiles are based on indicators that directly or indirectly represent sources of vulnerability. The indicators are combined and weighted to create composite indexes that illustrate how vulnerability varies spatially.

A base vulnerability index for India has been developed using indicators that reflect social, biophysical and technological vulnerability. The base vulnerability layer is overlaid with either a climate sensitivity index/ layer, based on climate norms from 1961–1990, or a trade sensitivity index/ layer. From these maps, districts that have both high climate and economic globalization vulnerability, (i.e., are doubly exposed) are identified. Villages for the case studies are selected from these highly vulnerable districts. The macro-level analysis will also include climate scenario data, thus capturing the dynamic aspect vulnerability.

## **Agriculture (Poster)**