



Tropentag, September 16-18, 2015, Berlin, Germany

“Management of land use systems for enhanced food security:
conflicts, controversies and resolutions”

Vulnerability of Maize Farming Households to Abiotic Stresses in South Asia: Results from India and Bangladesh

CHRISTIAN BÖBER, SUBASH S.P.

International Maize and Wheat Improvement Center (CIMMYT), India

Abstract

South Asia is highly vulnerable to climate change with increasing trends in the intensity and frequency of extreme weather events. The region accounts for more than 44 per cent of the world's poor in developing countries. Extreme weather events are more likely to occur in future; exacerbating production risks. Abiotic stresses such as drought and waterlogging are major sources of risk with respect to food security of small and resource poor farmers in rain fed and low lying areas of South Asia.

Maize (*Zea mays* L.) has the potential to alleviate rural poverty; contributing to food security. Susceptibility of maize to abiotic stresses can threaten farmers' livelihood, with the strongest impacts on smallholders with low financial and technical capacity to adapt to climatic variability and change. Incidences of drought coincide with high levels of poverty in maize based production systems in South Asia. Waterlogging affects about 18 per cent of the total maize production area causing an annual production loss of 25–30 percent.

The present study follows a contextual approach for vulnerability assessments. Composite indices are calculated to understand the nature and extent of maize farming households' vulnerability to abiotic stresses in Comilla district, Bangladesh and Panchmahal district, India. Micro-level data from 399 households are utilised to measure the extent of vulnerability as well as households' adaptive capacity to cope with drought and waterlogging. The effects of bio-physical, managerial, and socioeconomic factors are disaggregated to enable an assessment of different vulnerability dimensions.

The results show that bio-physical parameters are major factors influencing vulnerability. Crop management decisions have a significant influence on vulnerability to abiotic stresses. As stress incidences like waterlogging are farm specific, coping and adaptive strategies should be farm specific too. Farmers facing stresses are not undertaking adaptive measures. Changing planting dates to reduce stress exposure, is hardly feasible, as farmers are not willing to compromise on the production of other food or cash crops. Therefore the availability of more abiotic stress resilient maize cultivars could be a viable option to reduce farm households' vulnerability to abiotic stresses and production risks, and to stabilise household income and food security.

Keywords: Bangladesh, drought, India, maize, micro-level data, vulnerability, waterlogging