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## Effects of reported and observed weather shocks on crop losses in south-eastern Madagascar

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### Abstract

Climate change is already posing numerous risks to smallholder farmers in sub-Saharan Africa. Madagascar has been particularly affected in recent years, as weather shocks such as droughts and cyclones have strongly impacted agricultural households. These households, often with limited access to resources, will need to adapt to this new and continuously changing situation. New uncertainties and risks in relation to weather shocks and climate change are already taking effect, with crop losses as a common consequence, threatening the already fragile food security of households in the region. This study analyses the impact of weather shocks on households' pre- and post-harvest crop losses. We draw on household survey data from a representative sample of 600 farming households in three regions in south-eastern Madagascar strongly affected by climate change: Atsimo Atsinanana, Anosy and Androy. Using the survey data, we explore major vulnerabilities in crop production and post-harvest processing. Reported weather shock data and observed weather data from global gridded weather data products are used to study their impact on crop losses for a broad range of major cash and food crops, such as maize, peanuts, vanilla, coffee, and rice. Additionally, we analyse implications for households' food security and use the data set's extensive information on agricultural practices and reactions to weather shocks to explore and analyse avenues and practices suitable to increase households' resilience to weather shocks. We pay particular attention to potential heterogeneity in effects. The results of this study will contribute to informing interventions directed at improving farm households' resilience and food security.

**Keywords:** Crop loss, food security, Madagascar, resilience, weather shocks