



Tropentag, September 14-16, 2022, hybrid conference

“Can agroecological farming feed the world?  
Farmers’ and academia’s views”

## Developing a climate resilience index for cocoa farming households in Uganda

MAGDALENA PETER<sup>1</sup>, LINA TENNHARDT<sup>2</sup>, SABINE SCHLÜTER<sup>1</sup>

<sup>1</sup>*University of Applied Sciences Cologne, Inst. for Technology and Resources Management in the Tropics and Subtropics (ITT), Germany*

<sup>2</sup>*Research Institute of Organic Agriculture (FiBL), Dept. of Socioeconomics, Switzerland*

### Abstract

Cocoa is a climate-sensitive crop with growing global demand. In Uganda, the climatic suitability for cocoa is projected to improve during climate change, yet Ugandan cocoa farmers are affected by adverse effects of climatic events. While past studies have developed frameworks to measure farms’ climate resilience, no blueprint solution for all farming systems across the globe exists. The goals of this study are 1) to develop a climate resilience framework to assess the climate resilience of smallholder cocoa farms and 2) to implement and test the developed Climate Resilience Index (CRI) for a sample of cocoa farmers in Uganda.

The CRI quantifies climate resilience according to the three resilience capacities: short-term absorption, medium-term adaptation, and long-term transformation. Based on discussions with local experts on cocoa cultivation, existing climate resilience frameworks were adjusted and indicators revised to develop the CRI suiting the local context. Primary data from 203 households was used for the calculation of the CRI. First, responses of all 30 indicators were normalised and grouped by resilience capacity. We decided for an unequal, altered weighting approach of the indicators by applying a Principal Component Analysis for each resilience capacity. The scores of the first principal component, the means and standard deviations of each indicator were used to construct the CRI. We calculated the climate resilience scores for each farm per resilience capacity and an overall climate resilience score for every farm.

The results show the climate resilience of a cocoa farming household relative to the other households in the sample. 98.5% of farmers reported to have experienced a climatic shock or stressor within the past 12 months, mostly unpredictable rainfall and shifted rainy seasons. We observed little variation in absorptive scores which illustrates farmers’ similar capacities in absorbing minor short-term climatic shocks. Adaptive scores showed the highest discrepancy between farms, pointing out farmers broadly differing capacities regarding medium-term adaptation. Transformative scores displayed the least variability between farms and implies farmers’ equal need for support regarding structural long-term transformation.

The framework and results can inform regional policy support to strengthen climate resilience for Ugandan smallholder cocoa farms.

**Keywords:** Climate change, climate resilience, cocoa, Uganda

---

**Contact Address:** Magdalena Peter, University of Applied Sciences Cologne, Inst. for Technology and Resources Management in the Tropics and Subtropics (ITT), Köln, Germany, e-mail: magdalena.peter@smail.th-koeln.de