



Tropentag, September 20-22, 2023, hybrid conference
“Competing pathways for equitable food systems transformation:
Trade-offs and synergies”

Climate-driven crop suitability effects on conflict in sub-Saharan Africa

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Abstract

Climate change fundamentally affects agricultural systems and agricultural households. This can have implications that reach far beyond agriculture itself. An active field of study is the potential effect of weather and climate on conflict dynamics, with several channels explored in the literature that may explain why weather and climate events affect conflict propensity and intensity. In particular, climate-induced resource scarcity could ignite conflicts. In this study, we analyse a specific impact channel that may explain weather influence on conflict in areas with high agricultural dependency: changes in crop suitability. Crop suitability can be modeled using machine learning approaches and as a function of climate and spatial indicators. We use crop suitability models for the entire African continent to analyse influences of crop suitability changes on conflict incidence and intensity from 1997–2023, drawing on the ACLED database for conflict data. Focusing on the main crops produced in Africa, we distinguish between food crops and cash crops. The main hypothesis is that changes in crop suitability require replanting, reorganisation of plots and potentially abandonment of previously fertile areas. Such changes could influence demand in land, land transfers, and ultimately land conflict. Presumably, areas that are not directly affected by crop suitability changes but lie in the vicinity could be particularly affected through spatial spillovers, where pressure increases on land from areas that are affected by changes in suitability. Areas of particular interest include areas “at the fringe”, where crop farming and livestock production meet. Based on the empirically derived relationship between crop suitability changes and conflict occurrence, we conduct a back-of-the-envelope calculation to estimate potential future hotspots of conflict occurrence based on projected crop suitability, taking into account different climate scenarios. The results of this study will shed new light on the weather, climate, agriculture and conflict nexus, which can inform policies for sustainable land management with the aim of conflict prevention.

Keywords: Agricultural potential, climate change, conflicts, crop suitability