Tropentag, September 20-22, 2023, hybrid conference

"Competing pathways for equitable food systems transformation: Trade-offs and synergies"

Uphill shifting cultivation under pressure: Perspectives and adaptation of tribal farmers in northeast India

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Abstract

Shifting cultivation is an extensive subsistence farming system that has been practised for centuries by tribal communities in mountainous regions of South and Southeast Asia. The integrated and organic farming system provides food sovereignty and income for tribal communities, sustains established local plant varieties, and preserves traditional knowledge and cultural practices, and thus social cohesion. However, multiple stressors threaten the future of shifting cultivation. In some places, the emigration of a more educated younger generation reduces the available labour force. In other places, an increasing scarcity of fertile lands leads to shorter cropping cycles with a higher risk of soil degradation. More intense rainfall patterns under climate change are likely to exacerbate this risk.

Despite the importance of shifting cultivation for the livelihoods of tribal farming communities, its future remains largely unexplored. This study reduces this knowledge gap and attempts to answer the research question: What shifting cultivation futures are plausible under climate and social change?

This interdisciplinary study combines diverse methods from the natural and social sciences. We use the biophysical process model EPIC to explore possible climate futures of uphill shifting cultivation in Northeast India, accounting for daily weather impacts on soil erosion risk. In addition, we conduct and assess qualitative and quantitative interviews with tribal farmers about current threats to shifting cultivation, perceived climate change impacts, considered adaptation strategies, and future perspectives.

Our results show that shifting cultivation is affected by climate and social change in multiple ways. While simulations indicate substantial increases in soil erosion by 50 % and more than 100 % under global warming levels of 2 °C and 3 °C, respectively, towards the end of the century, interviews revealed rising temperatures and delayed onset of summer monsoon precipitation as major perceived threats to cultivation. Farmers also emphasised the risk of losing traditional knowledge due to increasing off-farm activities by the younger generation. Despite these threats, they perceive shifting cultivation as a comparatively climate-resilient cropping system and important safety net, especially for resource-poor farmers. This study discusses plausible pathways of future shifting cultivation and options for adaptation.

Keywords: Adaptation decisions, climate change, Northeast India, shifting cultivation, subsistence agriculture, tribal farmers, uphill farming

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