

A Landscape-scale Biodiversity Impacts Analysis of Côte d'Ivoire's Cocoa Cultivation Along Export Supply Chains

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1 Motivation

- Largest cocoa cultivation country
- Deforestation drives biodiversity loss
- Global biodiversity hotspots
- Tele-connected biodiversity footprint

- Coarse impact assessment model
- Earth observations are not integrated
- Missing spatial details of the export supply chain

2 Research Questions

- RQ1:** How can high-resolution earth observations be transformed into high-resolution land use maps?
- RQ2:** How can biodiversity impacts be modeled at the landscape scale, and the biodiversity impacts for cocoa cultivation be quantified?
- RQ3:** How can biodiversity impacts be linked to supply chains to track the tele-connected footprint?

3 Methods

Earth observations
Land statistics

Biodiversity intactness
Biodiversity importance

Sub-national exports supply chains

High-resolution land use mapping

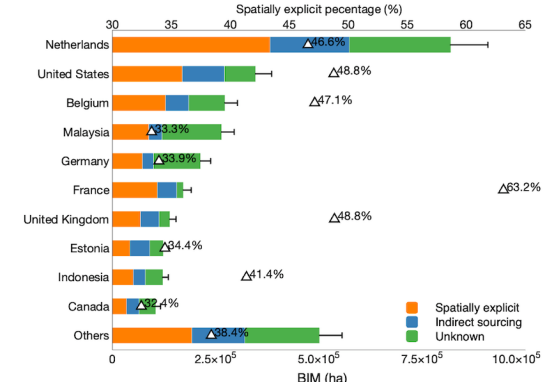
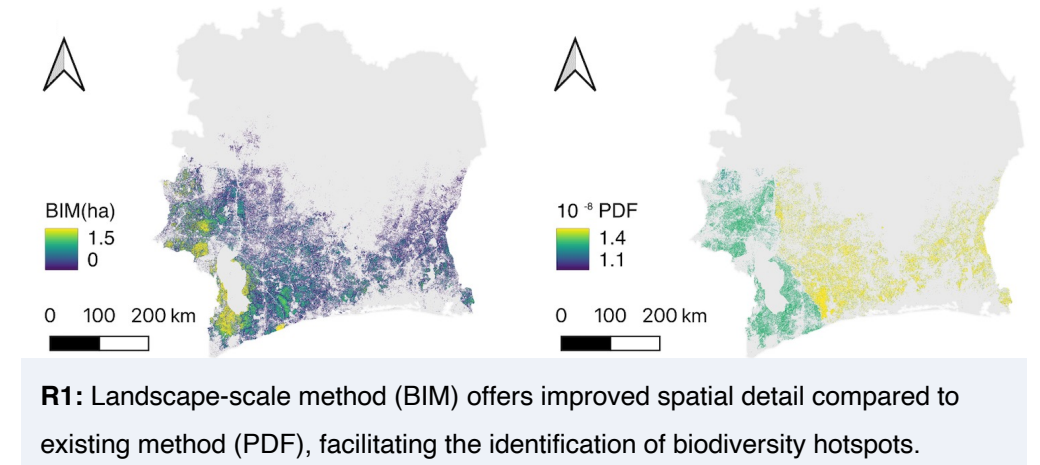
Landscape-scale biodiversity modeling

Biodiversity impact of cocoa cultivation along export supply chains

5 Contribution to Sustainable Food Systems

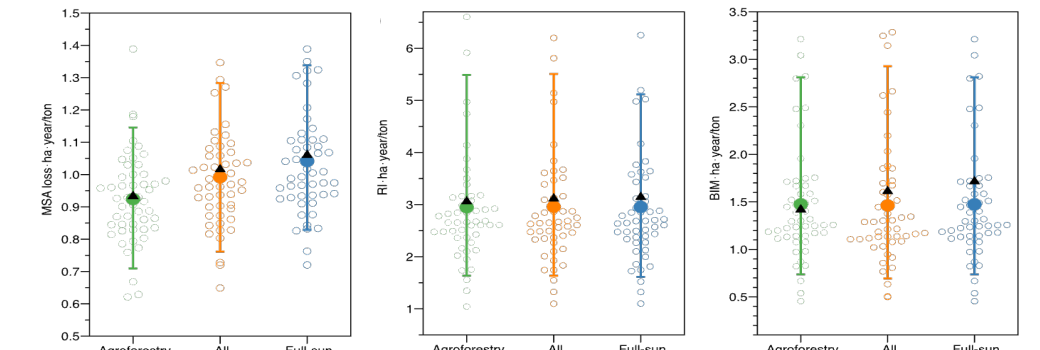
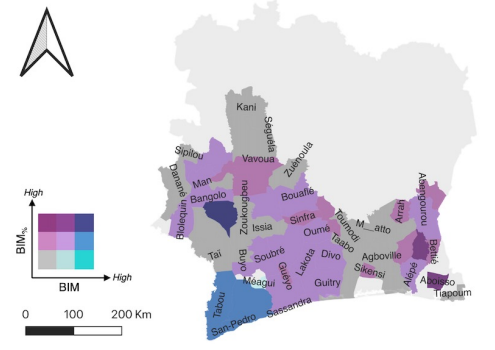
- SDG 15:** To protect land biodiversity, the first step is to understand the impacts caused by human activities.
- SDG 12:** A comprehensive understanding of biodiversity footprint promotes informed decision-making for sustainable agricultural production and consumption.
- SDG 10:** Shared biodiversity loss responsibility of production and consumption sides reflects environmental inequity and promotes further actions.

4 Results & Conclusion



R2: Cocoa cultivation accounts for ~13% of Côte d'Ivoire's land-use-related biodiversity impacts, with ~87% attributable to cocoa exports. The top ten importing countries account for ~84% of these impacts.

R3: The disparity in biodiversity impacts between global (BIM) and local perspectives (BIM_%): cocoa cultivation in departments like Guiglo can account for up to 43% of impact share, while other departments are more important from a global impact perspective.



R4: The land-use-related biodiversity impacts of agroforestry cocoa cultivation are not consistently lower than full-sun cocoa due to different spatial distribution.

15 LIFE ON LAND

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

10 REDUCED INEQUALITIES