

PhD Abstract

An integrated analysis of the spatial effects of tree-crop farming systems on a mosaic landscape in Ghana

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Problem definition

Global demand for food and raw materials is escalating in response to the needs of rapidly growing urban populations and lifestyles. The government of Ghana facilitates policies and programmes that stimulate tree-crop production (notably cocoa and oil palm) for economic growth, jobs and sustained income for rural farmers. Tree-crop expansion has implications for landscape diversity and structure as well as ecosystem services and livelihoods. This study combines spatial analysis with multi-stakeholder understandings of landscape dynamics associated with the expansion of tree-crop systems and their influence on landscape multifunctionality.

Research Questions

The study asks (1) What are the effects of tree-crop farming on the composition and spatial structure of mosaic landscapes? (2) How have changes in the landscape impacted ecosystem services availability and access? and (3) how do different stakeholder groups conceive their desired landscapes and ways to achieve them?

Theoretical Framework

The thesis is positioned in debates on sparing vs. sharing, integration-segregation theory, and integrated landscape approaches. A landscape is both a natural and a social construct. Landscape multifunctionality is a function of components and structure (shape, size, arrangement, etc.). Mosaic landscapes with

land-cover types of varying, but integrated, characteristics provide a myriad of services to various stakeholders as opposed to those with large segregated blocks, each with a specific functional role. Expansion of tree crops is expected to shift landscapes towards segregation and reduce current availability and outputs of future services. Delivery of desired future services is based on landscape state and current stakeholder decisions regarding the landscape.

Methodology

This study combines satellite-based remote sensing, a questionnaire survey and focus group discussions to assess trends in landscape structural change, dynamics in ecosystem service use, and stakeholder perceptions of landscapes transitioning into tree crops. It is carried out in mosaic landscapes of cocoa and oil palm, food-crop land, forest and settlements in eastern Ghana.

Expected Results

Expected findings will include:

- Dominant land-cover types and their contribution to total landscape dynamics
- Different stakeholder preferences regarding ecosystem services in mosaic landscapes.

Expected Graduation

December 2020