

C06

Farm-level optimization of land use systems in Indonesia under consideration of uncertainty and ecological effects

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Background and Motivation

- Transformation of rainforest areas in Indonesia
 - Higher profitability of more intensively managed land use systems
 - Pressure to conserve forest resources especially in the context of biodiversity and global climate change

➡ **Economic-ecological tradeoffs which have to be quantified**

- Characteristics of most land use systems
 - Perennial crops such as rubber and palm oil
 - Varying cultivation intensities differ in income, risk and ecological function, compete with each other

➡ **Methodological challenges**

Methods and Work Schedule

- a) *Estimation of the subjective risk attitude of farmers*
- Incentive-compatible Holt and Laury experiment with 404 farm households from the project region in Jambi
 - Substantial variations of the risk preferences between different groups of farmers are expected
 - Substantial effects of risk preferences on production decisions
- b) *Determination of the optimal intensity of land use*
- Multi-period business simulation game
 - We expect that the reduction in the amount of fertilizer depends on the design of compensatory payments

Objectives

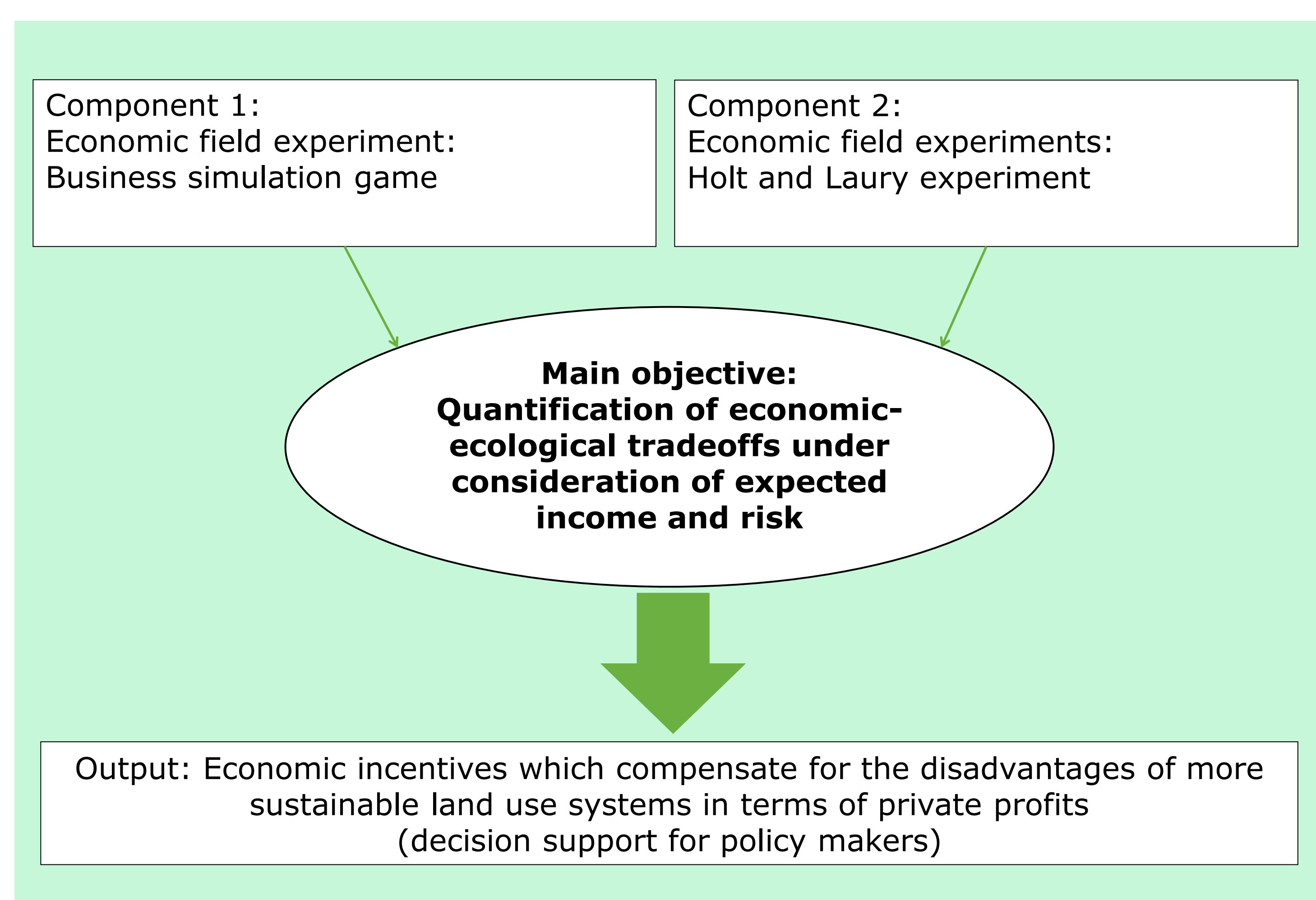
Content

The overall objective of this research project is to determine optimal intensity of land use. We will be able to analyze the effects of different economic incentives to realize more sustainable land use intensities in different villages in Jambi from a normative perspective (improved policy impact analysis).

Methodological

- Development of a business simulation game (flexibility regarding the stochastic process of prices and regarding the configuration of compensatory payments)
- Integration of the results of a Holt and Laury experiment in business simulation game to account for risk preferences

Objectives and Methods



Integration and Collaboration within EFForTS

- With C07 Qaim/Schwarze: Shadow prices and data regarding the profitability of different land use systems will be shared
- With C08 Wollni/Ibanez: Design of the business simulation game, and Holt and Laury experiment, Cooperative data collection

Preliminary Results

Business simulation game

The graph indicates the average fertilizer use per period and group in the business game. The groups differ in the design of compensatory payments they received for fertilizer reduction after period 5.

Group treatment after period 5

- Group A: No treatment (Control group)
- Group B: Low subsidy with high probability
- Group C: Low punishment with high probability
- Group D: High subsidy with low probability
- Group E: High punishment with low probability

