Mitigating the negative impacts of the maize boom on landscapes and livelihoods in Lao PDR

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Outline

• Maize boom trajectories in Southeast Asia
• A framework for understanding boom crop trajectories
• Gaming-simulations to reveal underlying mechanisms
• The maize boom from the bottom-up
• Lessons for timely and relevant intervention
Maize boom trajectories

Source: FAO Stat

Source: Index Mundi
Maize boom trajectories

Change in maize cultivation

Southeast Asia

Source: FAO Stat
Maize boom trajectories

Change in maize cultivation

Source: FAO Stat
Maize boom trajectories

Maize production at village level

Maize production in Laos

Source: FAO Stat
A conceptual framework for intervention on boom crop trajectories

Introduction

Methods

Results

Discussion

Concept

Adoption

Expansion

Intensification

Diversification

Abandonment

Boom crop

Forest in various succession stages

Upland rice

Paddy rice

Time & market integration

Alternative cash crop

Boom ➔

Expansion + Intensification

Diversification

Abandonment

Time ➔
Living with the maize boom

- **2003-2009**
  PCADR - Conservation agriculture project

- **2009**
  PAMPA – Impact assessment project

- **2015**
  EFICAS - lessons from previous projects
Disentangling the mechanisms of the boom from the inside
Disentangling the mechanisms of the boom
exploring local contexts

1 - Focus group
to reconstruct village trajectory with village committee and farmers pioneering in maize

connection to interviewees
legitimacy by village leaders

2 - Individual interviews
to reconstruct household trajectories of active speakers in focus group and complementary farmer types (e.g. cover rich and poor)

parameters for game
definition research question

3 - Game
to explore a selected research question for a decision and its context through game development, simulations with smallholders and debriefing

| round1 | round2 | round3 |
Multi-scale gaming approach to the boom

- decision making embedded in local contexts
- generalizing to emergent level of the boom

Focus group
Interviews
Game

Maize investments and alt. LU
Maize risk behaviour
Maize and land degradation

Maize price and allocation

Houaykai
MIALU
MaRISK
PALUM
Mayphonexai
Namgnang
TAKIT

MAHASALY

adoption

expansion, intensification

diversification, abandonment

time, market integration

Maize investments and alt. LU
Maize risk behaviour
Maize and land degradation

Take it!
Adopting alternatives to maize
Maize boom game ‘mahasaly’ validation workshop with experts

Ornetsmüller C, Castella JC, Verburg PH. (submitted) A multi-scale gaming approach to elucidate farmer’s land use decision making in the maize boom of Laos. *Ecology and Society*
The maize boom from the bottom-up

- Impacts on livelihoods
  - General increase of land holding size
  - Commodification of the land
  - Income increase... and also indebtedness
  - Economic differentiation, inequalities (GINI index ↑)

Introduction

Methods

Results

Discussion

![Cultivated area / HH (ha)](image)

Kham district

- Maize

Nonghet district

- Upland rice
- Maize

![Graph](image)
The maize boom from the bottom-up

• Impacts on environment
  – Deforestation – biodiversity loss
  – Land degradation (tillage erosion)
  – Pollution by herbicides
  – Landscape simplification

Land use change in Kham basin in the 2000s

Complex landscape mosaics  →  Maize monocropping
Opening the black box of the maize boom

• Why are booms repeating again and again?
  Why don’t ‘they/we learn’? Who learns?

• Boom as a gateway to capital-intensive agriculture
  Transforming frontier landscapes and livelihoods


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Shifting cultivation

High input monocropping

market stability

no input vs debts

labour productivity

local network

children education

market literacy

Education

knowledge networks

high input monocropping

a gateway to capital-intensive agriculture

trust building with trader

contracts are sacred

labor

interest rate

price inputs

cash crops vs food crop

income

trust building with trader

contracts are sacred

market stability

local network

motorcycle

changing aspirations

children education

market literacy

financial literacy

knowledge networks
Thinking out of the ‘black’ box of the boom

- Windows of opportunity
  - **No technical intervention** possible during the expansion-intensification phase of the boom,
  - Two opportunity windows for intervention

Initial stage of the transition from subsistence to commercial farming

Aftermath of the boom: advanced land degradation
Thinking out of the ‘black’ box of the boom

• Windows of opportunity

• Short term benefits vs long term investments
  – Maize money is often reinvested into long term, more sustainable agricultural investments, e.g. paddy terracing, tree plantations; and in children’s education
  – Strategies to minimize income loss during transition from maize to alternatives – relay income sources, e.g. tractor service, off-farm jobs,

-> combine short and long term perspectives in policy designs (e.g. forest, poverty alleviation) and PES mechanisms
Take home messages

• Land science looks ex-post at land use trajectories; participatory simulations helped capturing rapid changes and a-priori, early warning signs of booms,

• Mitigating impacts of boom crops requires considering both the whole trajectory of change and contextualized decision-making,

• Windows of opportunity were identified for timely intervention -> engaging stakeholders into transformative landscape approaches
Thank you for your attention...
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