

Drivers and impacts of swidden intensification in DRC

Moonen Pieter^{1*}, Verbist Bruno¹, Boyemba Bosela Faustin², Bwama Meyi Marcel², Kearsley Elizabeth³, Van Rompaey Anton¹, Muys Bart¹

¹ Department of Earth and Environmental Sciences, KU Leuven, ² Faculté des Sciences, Université de Kisangani, DR Congo, ³ Department of Applied Ecology and Environmental Biology Ghent University *pieter.moonen@kuleuven.be

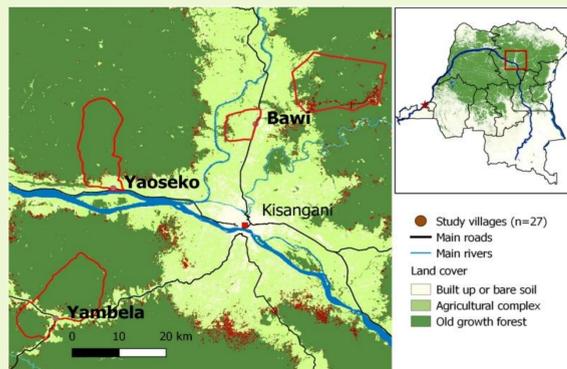
Problem

Context



- Swidden seen as obstacle to sustainable land use
- REDD+ policies aiming to intensify land use
- Drivers, impacts and feedbacks not well understood

Study area



Objectives

Drivers of change

State and impact
Ecosystem functioning
Perceived impact

Management responses

Methods

Drivers of change

- 27 villages
- Socio-economic survey
- Land use change analysis

PCA

Ecosystem functioning

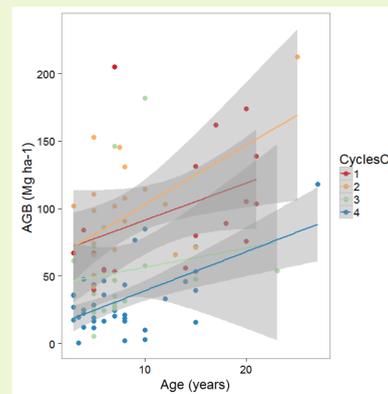
- Survey in 98 plots in 3 villages
- Management history
- Func. biod. and structure
- Biomass regrowth rate

→ Confirmatory path analysis

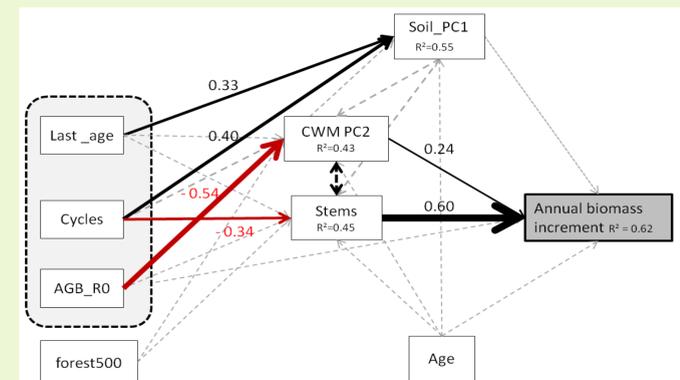
Local cognitions

- Survey in 3 focus villages
- Household survey (n=82)
- Focus groups

Swidden intensification reduces biomass regrowth



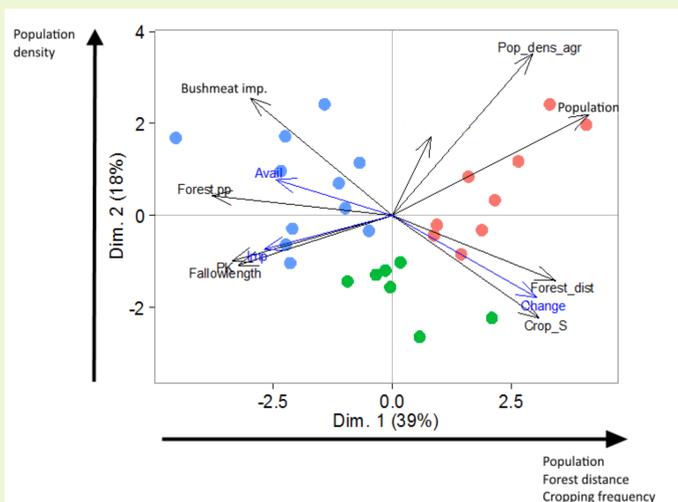
Aboveground biomass in function of fallow age at measurement (n=98), per cycle



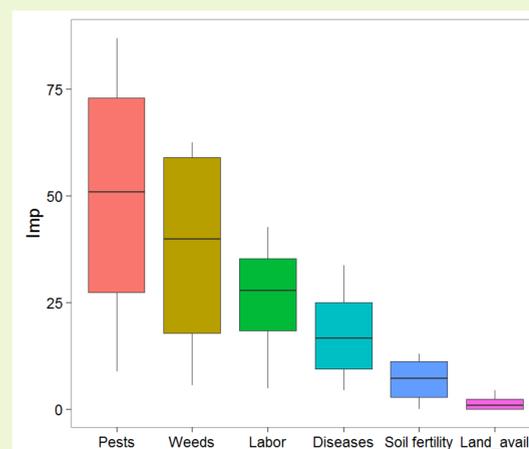
Annual biomass increment decreases with repeated cropping cycles. Path diagram of best model based on fallows aged 5 to 10 years (n=58)

Results

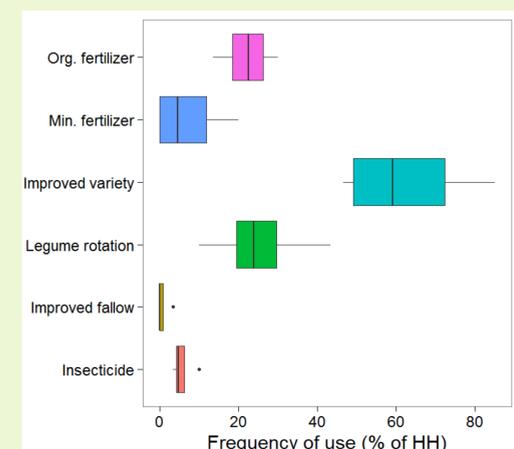
Population growth and development needs drive agricultural output demand



Pests and weeds perceived as main problems



Perceived importance of problems affecting agricultural performance



Experience with intensification techniques

Conclusion & implications: opportunities for sustainable land use

- Local perceptions of problems in agriculture differ from external perceptions
- Population growth and increasing marketing increase agricultural demands
- Increasing forest distance induces agricultural intensification
- Increasing cropping frequency most important intensification practice
- Repeated cropping leads to reduced fallow ecosystem functioning

- Gradual decline in landscape carbon and biodiversity
- Target interventions in function of local pressure
- Include local demands in interventions
- Productive fallows and perennials can be a win-win in high-density villages

Conclusion