

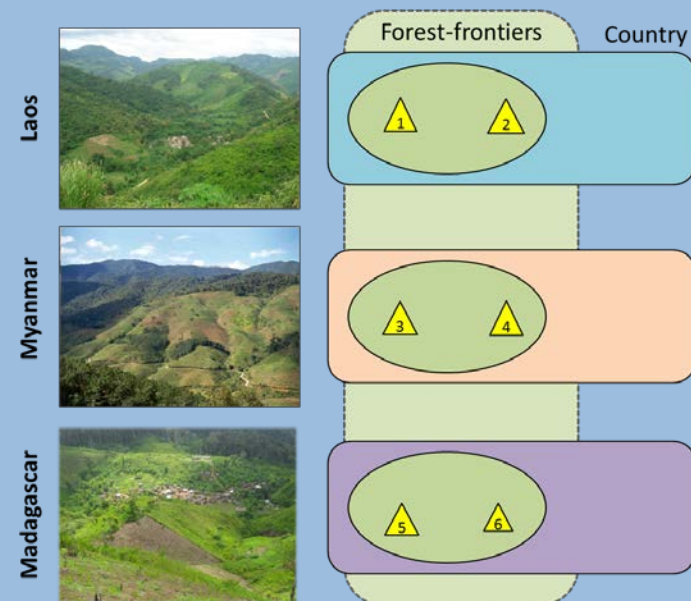
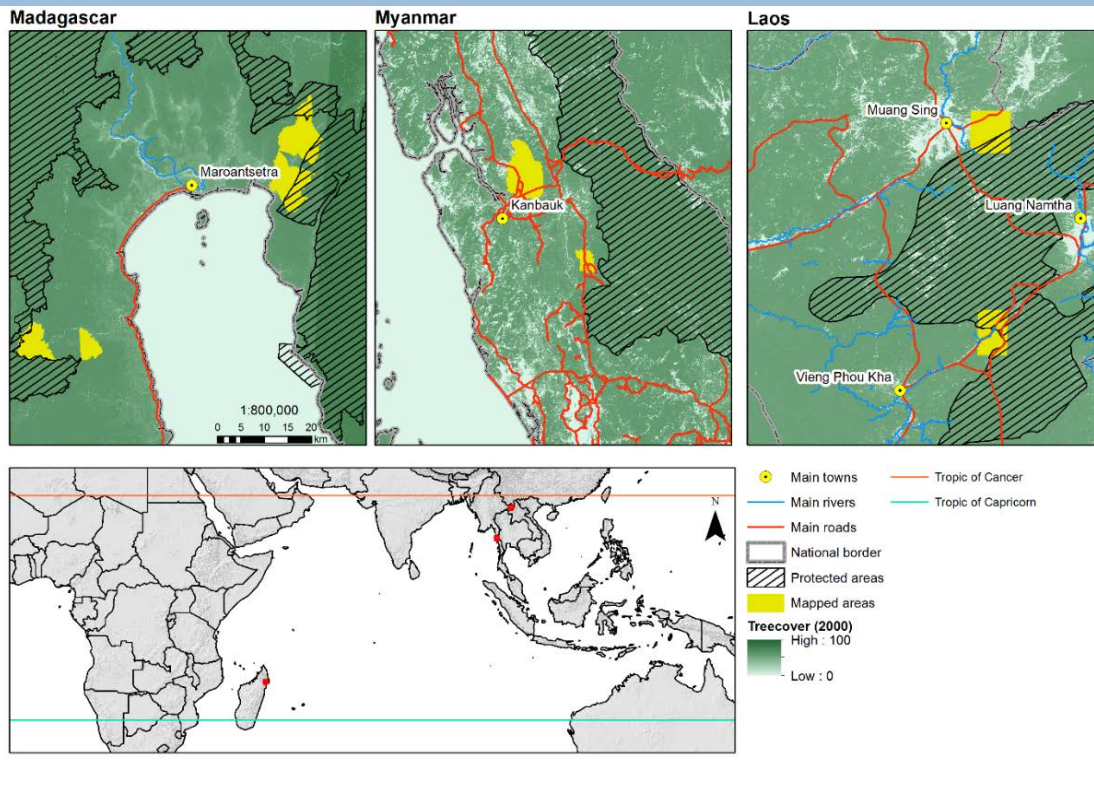
Operationalizing the telecoupling concept to assess land system regime shifts, land use decision making, and impacts on human well-being in tropical forest frontier landscapes:

first empirical results from Laos, Madagascar, and Myanmar



**Swiss Programme for Research
on Global Issues for Development**

Case study landscapes in tropical forest frontier contexts



3 Hypotheses

> **1. Problem-oriented:**

With increasing telecoupling the capacity of socio-ecological systems to support ecosystem service flows and human well-being decreases

> **2. Solution-oriented:**

Telecoupling involves new and distant stakeholders. Their involvement in land governance can increase the adaptive capacity of socio-ecological systems

> **3. Transformation-oriented:**

Learning processes among multiple actors contribute to adaptive decision-making and innovative governance schemes

1. Problem-oriented: identify spatially explicit land system regime shifts

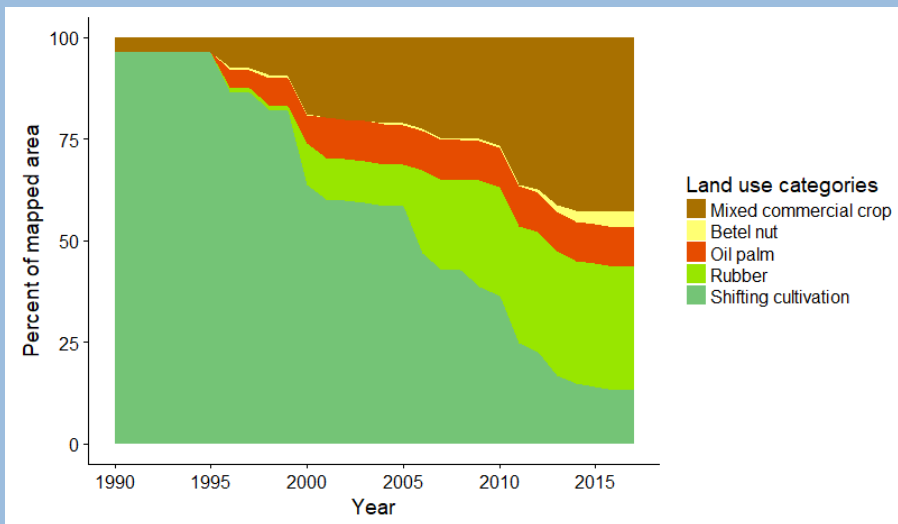
5-step approach

- 1) Design of the land use categorization system
- 2) Object-based segmentation and visual interpretation of VHR images
- 3) Village-level participatory mapping workshop
- 4) Field walks for enhanced spatialization
- 5) Data transfer into a geographic information system

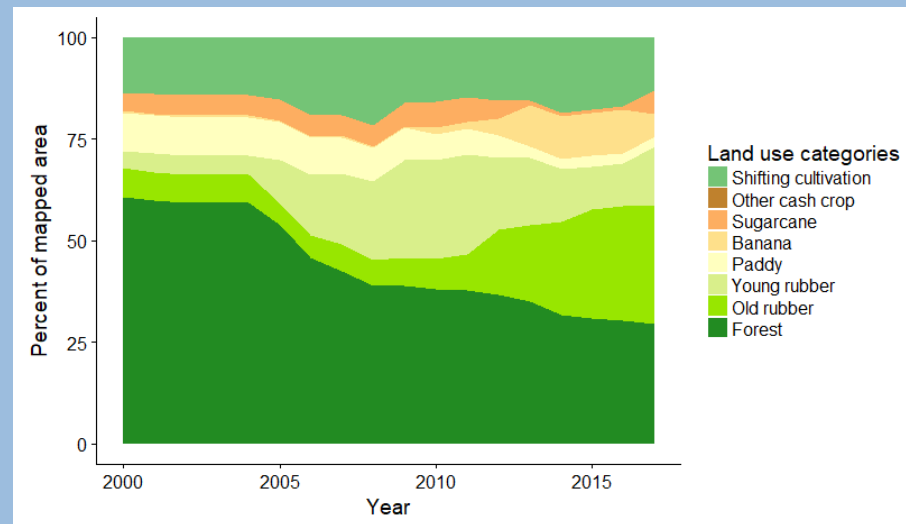
-> Zaehring et al. (2018). A novel participatory and remote-sensing-based approach to mapping annual land use change on forest frontiers in Laos, Myanmar, and Madagascar. [Journal of Land Use Science.](#)

Empirical result: land system regime shifts in Myanmar and Laos

Myanmar (Hein Ze)
1990-2017



Laos (Oudomsin)
2000-2017



1. Problem-oriented: impacts of land use changes on human well-being

Changes in well-being over the last 20 years, according to Nussbaum's list of well-being dimensions

In each case study landscape at village level;

- Gender-separated focus group discussions
- Qualitative interviews with 60-100 land users



Madagascar



Laos



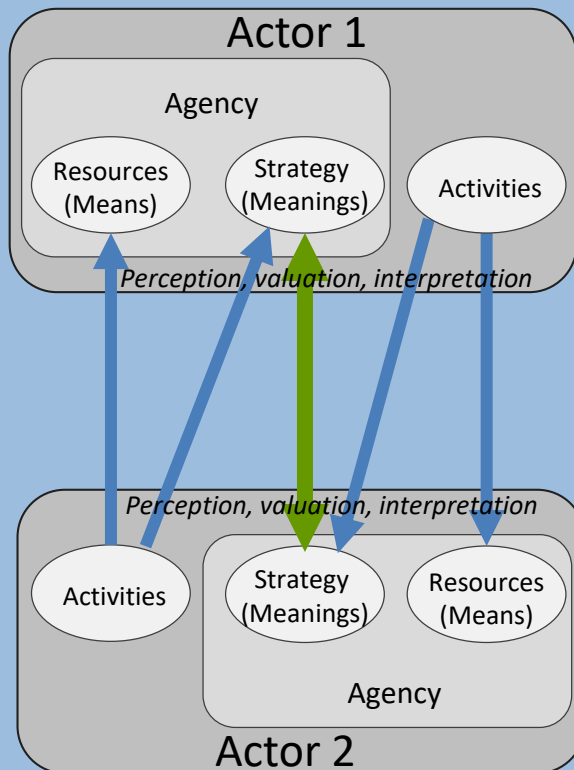
Myanmar

Empirical result: changes in human well-being over the last 20 years

	Laos		Madagascar		Myanmar	
	♂	♀	♂	♀	♂	♀
Health	↓↑	↑	↓		↑	↑
Being well nourished	↑	↑	↓	↑	↑	↑
Good social relations	↓	↑	↓		↑	↑
Education	↑	↑	↑	↑	↑	↑
Income opportunities	↑	↑	↓↑	↑	↓↑	↑
Security	↑		↓	↓	↑	↑
Healthy environment	↓↑	↑	↑		↓	↑↓

↑ increase
↓ decrease

2. Solution-oriented: a process-based approach combining an actor- with a network-perspective



Flow of goods, capital, information

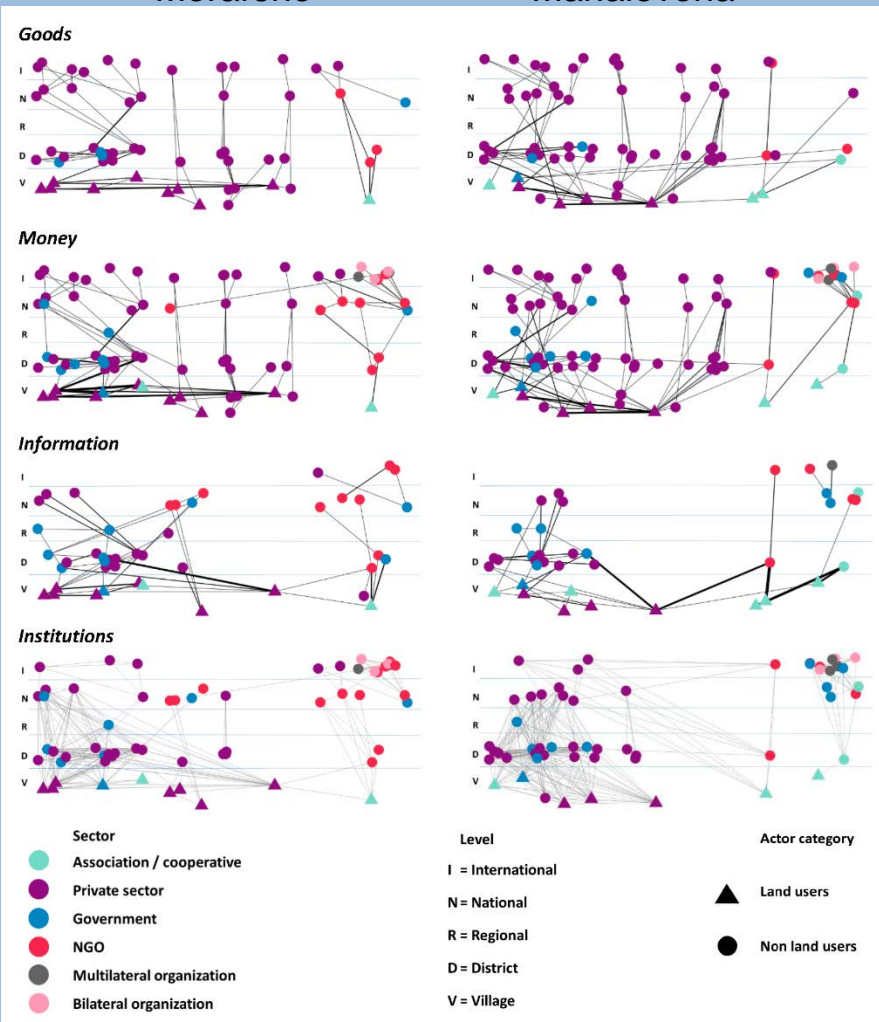


Shared institutions

Empirical results: networks of actors, flows, and institutions in Madagascar

Morafeno

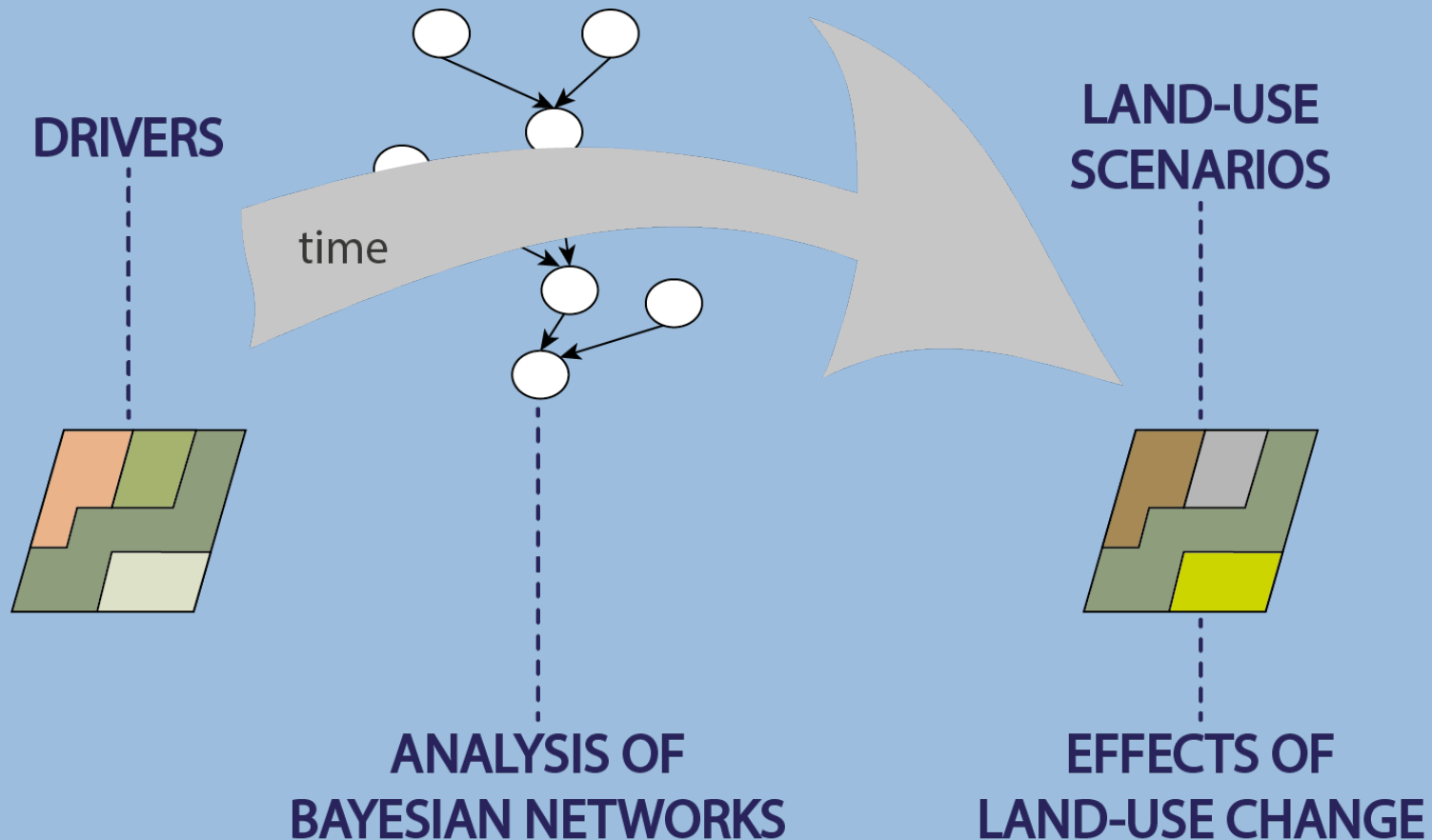
Mahalevona



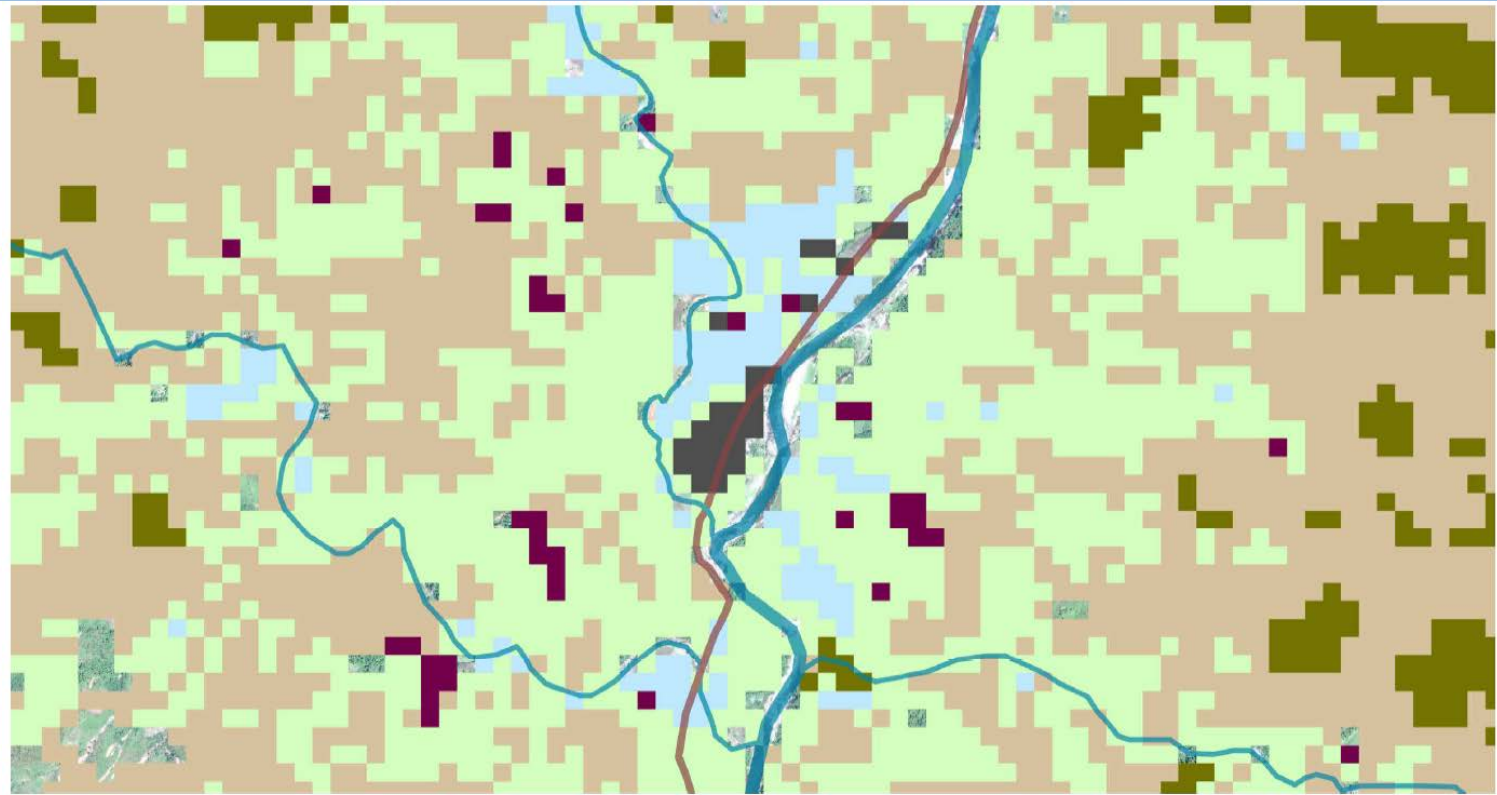
Standardized actor survey with snowballing approach

- Key actors are from the private sector (cash crop trade)
- Government is present at every level, but activities controlled by private sector actors
- Conservation and agricultural investment sectors have almost no links

2. Solution-oriented: participatory modelling of future land use

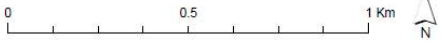


Empirical results: Predictions of land use 2023 in Fizono, Madagascar, under BAU scenario



Fizono
Toe-draharaha mahazatra
Business-as-usual
Fampiasana tany 2023
Utilisation des terres 2023
Land-use 2023

- Jinja
- Ala
- Maison
- Jirofo
- Tanimboly
- Horaka
- Kizana
- Kizana + Jirofo



20 x 297 mm

3. Transformation-oriented: continuous stakeholder learning platforms

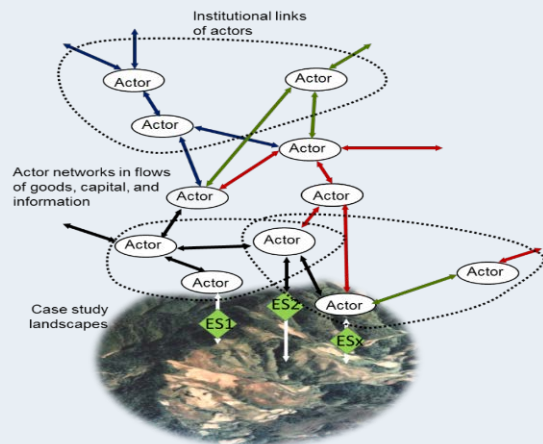
Requires different approaches according to the political and social context:

- **Madagascar:** platforms at 3 levels, interactions between various stakeholders within and between the platforms (cross scale)
- **Laos:** platforms at 4 levels, interactions mainly between governmental actors within the levels
- **Myanmar:** platforms at 2 levels; at regional level the project links to professionally moderated oil palm platform

3. Transformation-oriented: partnership actions for cooperative telecoupling

Pathways to impact

Systems interaction and power relations:



Theory of change

Emergence concept based on complexity theory:

1. Stakeholders' capacities
2. Creating networks
3. Communities of practice
4. Pioneering transformation efforts

Operationalization

- Establish multi-stakeholder platforms
- Co-design and co-production of knowledge
 - Transformative strategy development
- Partnership Actions for Cooperative Telecoupling (PACTs)

Preliminary conclusions

- Telecoupled forest-frontier landscapes are experiencing land use regime shifts with unprecedented consequences for social-ecological systems
 - A priori setting of system boundaries is counter-productive to identifying change agents in land governance
 - Making flows transparent is an important component of social learning in telecoupled systems
- Using telecoupling as a lens, combining a place-based with a process-based perspective, pushes us to ask the relevant research questions in land science

Thank you for your attention!

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