



KEYNOTE SESSION 1

AGRARIAN TRANSITION AND FARMING SYSTEM DYNAMICS IN THE UPLANDS OF SOUTHEAST ASIA

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Conservation Agriculture and Sustainable Upland Livelihoods
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OUTLINE

- **Land use trajectories and the agrarian changes**
 - The origins of SEA agricultures: rice civilizations - commercial plantations
 - The drivers of change: agricultural expansion and intensification
 - Upland farmers, left behind mainstream development trends
- **Socio-ecological issues associated with land use transitions in the uplands**
 - Deforestation, land degradation and poverty
 - Commercial agriculture and livelihood vulnerability
 - Territorialisation of the margins and landscape governance
- **What are the prospects for conservation agriculture?**
 - Adapting innovations to a dual agriculture
 - Identifying windows of opportunity in space and time
 - Connecting actor-networks and negotiating innovation pathway

THE ORIGINS OF SOUTHEAST ASIAN AGRICULTURES



■ Rice civilisations

- Swidden agriculture:
 - low population densities
 - high return to labour
 - segmental social organization
- Lowland paddies:
 - high population densities
 - high return to land
 - hierarchical social organization

■ Commercial tree plantations

- Coffee, rubber and oil palm for export
 - colonial period → expansion 20th century
 - large farms vs. smallholder plantations
 - mono-species vs. agroforests

Land use trajectories

- The origins of SEA agricultures
- The drivers of change
- Upland farming

Socio-ecological issues

- Deforestation
- Livelihood vulnerability
- Landscape governance

Prospects for conservation agriculture?

- Adapting innovations
- Windows of opportunity
- Actor-networks

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THE DRIVERS OF AGRARIAN CHANGES

■ Agricultural intensification

- Green Revolution
 - improved seeds, fertilisers and pesticides
 - pro-active government policies (subsidies, investments in R&D, etc.)

■ Agricultural expansion

- Colonisation of the upland margins
 - population resettlement - pioneer fronts
 - reconfiguration of rural territories and relations between lowlands and uplands



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Prospects for conservation agriculture?

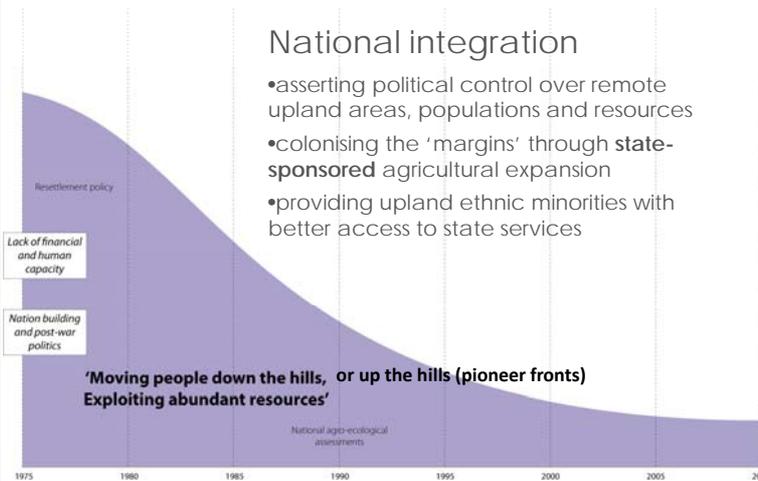
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THE DRIVERS OF AGRARIAN CHANGES

National integration

- asserting political control over remote upland areas, populations and resources
- colonising the 'margins' through **state-sponsored** agricultural expansion
- providing upland ethnic minorities with better access to state services



Lestrelin G., Castella J.C., Bourgoin J. (2012) Territorializing sustainable development: The politics of land-use planning in the Lao PDR. *Journal of Contemporary Asia* 42(4), 581-602.

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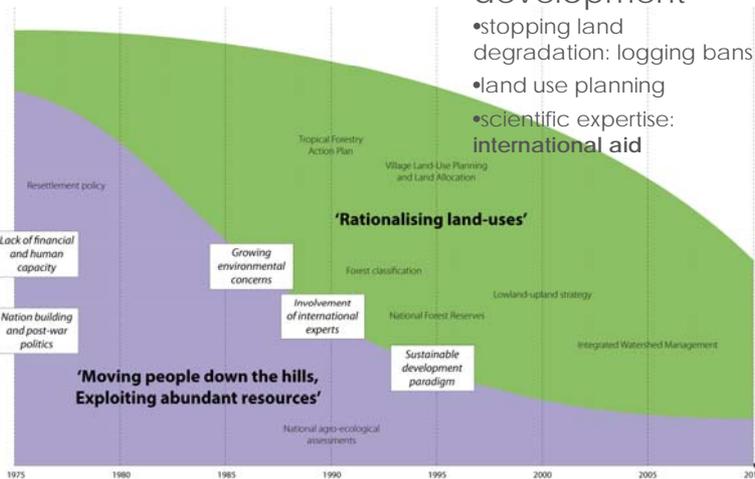
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THE DRIVERS OF AGRARIAN CHANGES



Sustainable development

- stopping land degradation: logging bans
- land use planning
- scientific expertise: international aid

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Socio-ecological issues

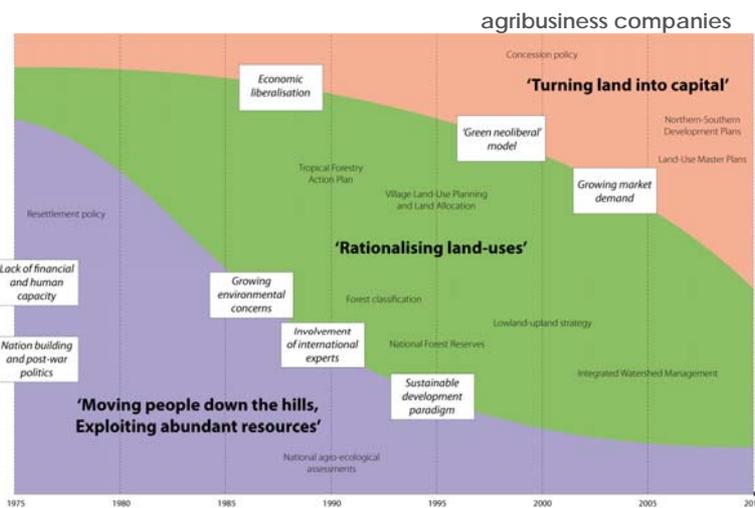
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THE DRIVERS OF AGRARIAN CHANGES



agribusiness companies

'Turning land into capital'

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Socio-ecological issues

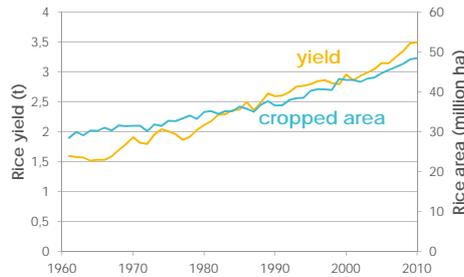
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THE IMPACTS OF AGRICULTURAL EXPANSION - INTENSIFICATION



Source : FAO-Stat 2012

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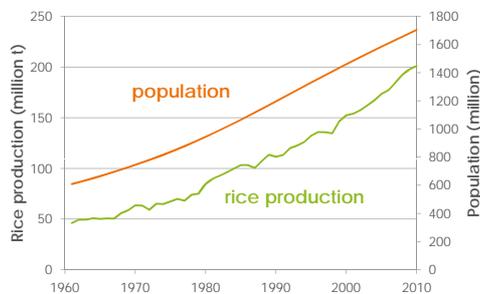
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THE IMPACTS OF AGRICULTURAL EXPANSION - INTENSIFICATION



■ Improved food security

- rice production growth rates exceeded population growth rates



Source : FAO-Stat 2012

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THE IMPACTS OF AGRICULTURAL EXPANSION - INTENSIFICATION



■ Improved food security

- rice production growth rates exceeded population growth rates
- decline in rice price benefited the rural poor
- feed the urban population, ensuring greater competitiveness of agro-industrial products

■ An export-based agricultural development

- agro-industrial development, emergence of the 'Asian Tigers'
- urbanisation - changes in consumption patterns
- rural exodus → adaptations to lack of rural workforce: e.g. direct sowing, mechanisation

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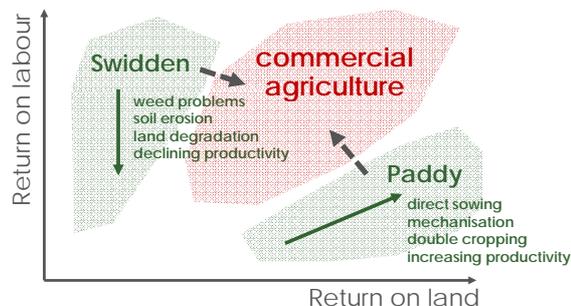
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IMPACTS ON UPLAND FARMING SYSTEMS



■ Upland farmers, left behind by mainstream development trends...

- the Green Revolution remained marginal in the mountains: limited to favourable lowlands,
- swidden agriculture under pressure from governments → shortening fallow periods



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IMPACTS ON UPLAND FARMING SYSTEMS

- Upland farmers, left behind by mainstream development trends...
- ...explore alternative agricultural pathways
 - changes in swidden practices
 - use of chemical fertilisers, herbicides,
 - crop-livestock associations, organic fertilisers,
 - tillage on slopes,
 - land use conversion - intensification
 - terracing where labour, capital and water are available and land tenure is secured,
 - also contour hedgerows, grass strips, but limited adoption,
 - diversification
 - hybrid maize, cassava grown with shorter fallow periods
 - smallholder tree plantations
 - off-farm



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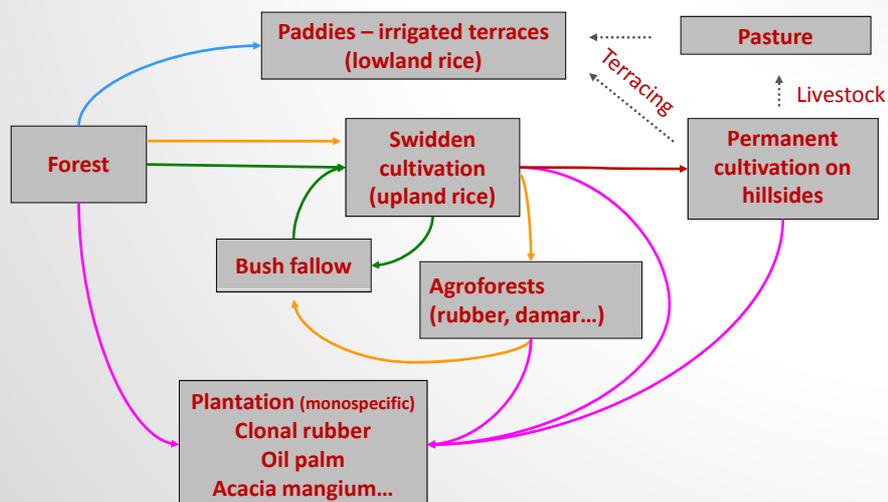
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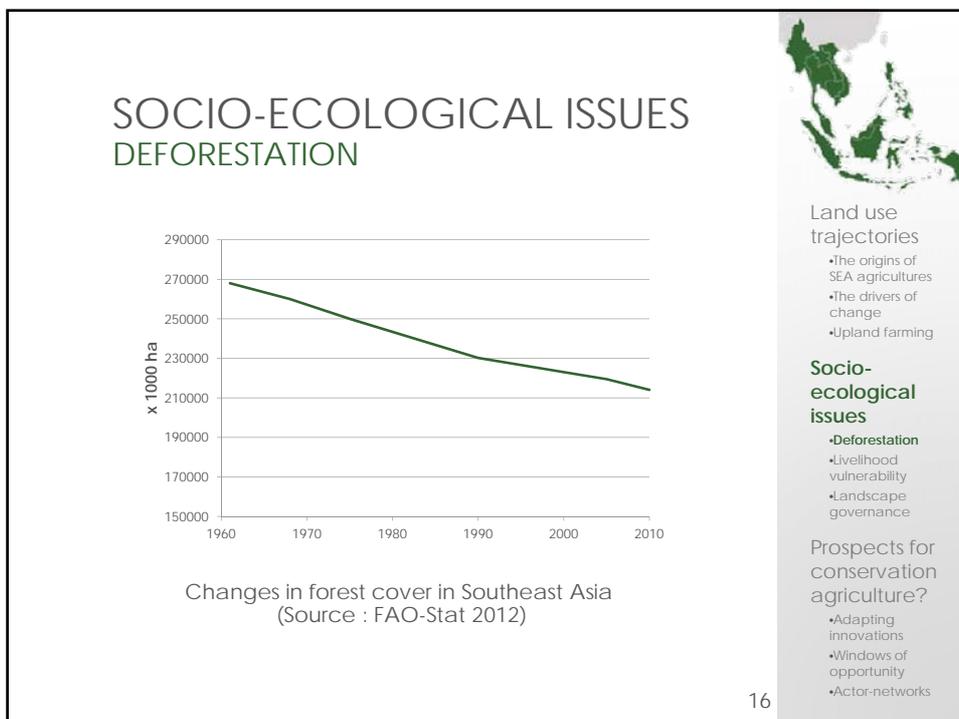
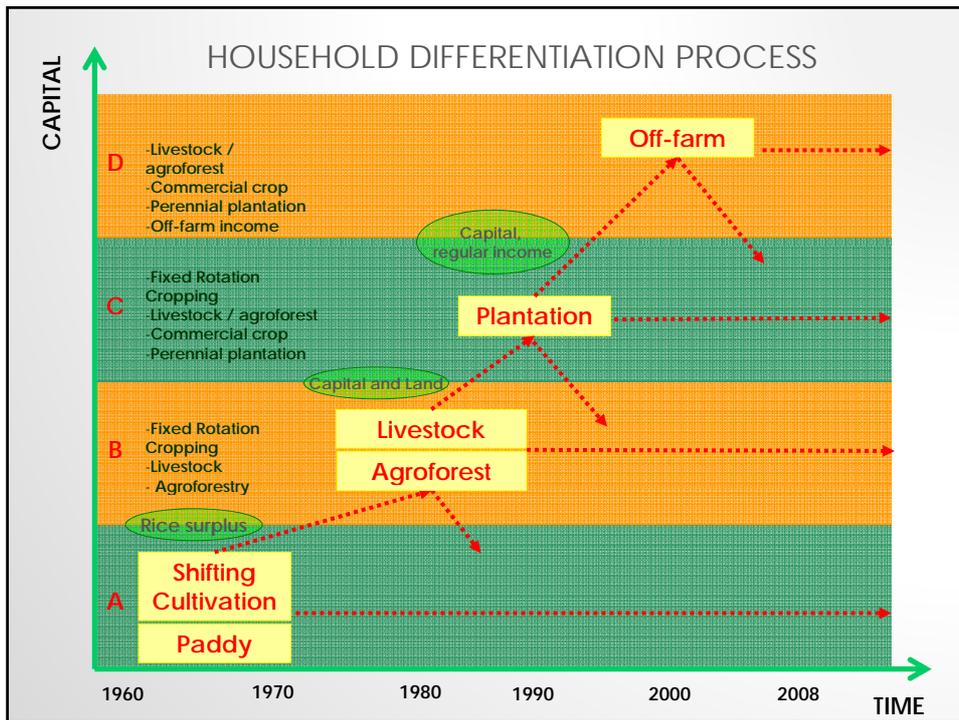
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LAND USE TRANSITIONS AND UPLAND FARMING SYSTEMS



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SOCIO-ECOLOGICAL ISSUES DEFORESTATION



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■ Land 'degradation chain' discourses

- deforestation -> soil erosion -> siltation of reservoirs
- swidden systems -> spiral of poverty
- diversification -> HH differentiation -> inequalities

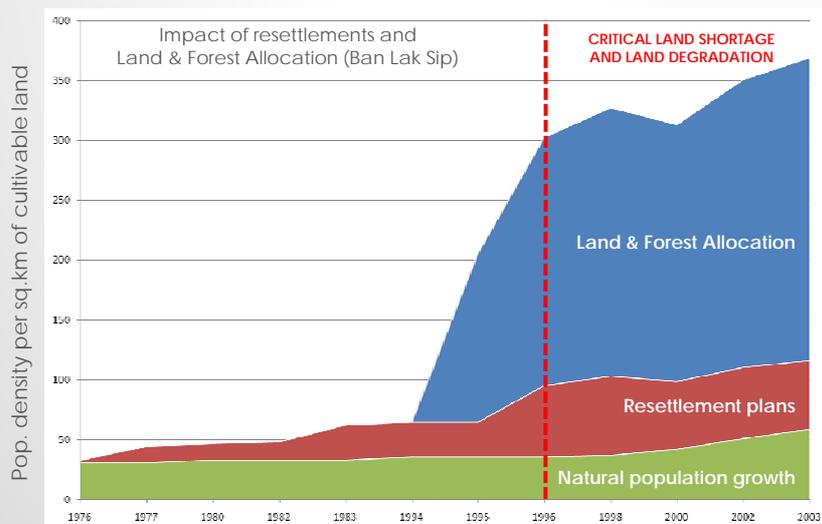
■ Uplands development policies

- forest preservation - conservation areas
- eradication of swidden agriculture
- resettlements - land use planning

-> government policies have a critical impact on land uses and livelihoods

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SOCIO-ECOLOGICAL ISSUES LIVELIHOOD VULNERABILITY



Lestrelin, G., Giordano, M. (2007). Upland development policy, livelihood change and land degradation: interactions from a Laotian village. *Land degradation and development* 18, 55-76.

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SOCIO-ECOLOGICAL ISSUES LIVELIHOOD VULNERABILITY

- **Govt lease land concessions to investors**
 - land leases for tree crop plantation (e.g. oil palm)
 - extraction and sale of the timber in concessions
 - land grabs, evicted HH, migrant workers
- **Contract farming (state, company, farmer)**
 - nucleus estate model, 2+3 contract farming
 - relations between upland dwellers and agribusiness companies are multiple and complex
 - tend to specialise in a limited number of commodities, indebtedness, price fluctuations -> vulnerability

-> multinational agribusiness companies are replacing the states in driving land use transitions



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- **Livelihood vulnerability**
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SOCIO-ECOLOGICAL ISSUES LANDSCAPE GOVERNANCE

- **Transformations of agrarian landscapes**
 - from complex landscape mosaics to homogeneous landscapes
 - negative impacts on ecosystem services (e.g. water, biodiversity)



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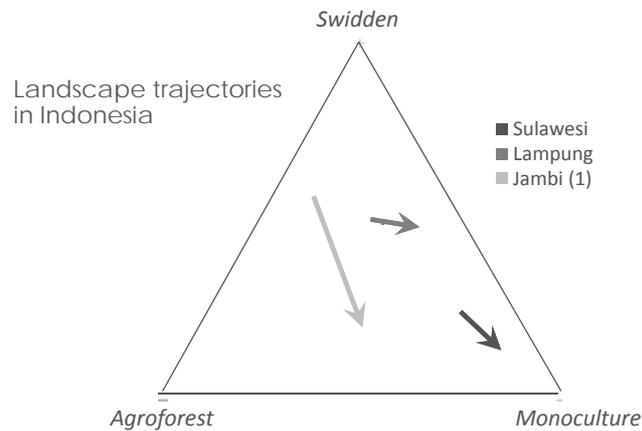
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Castella J.C., et al. (2013) Effects of landscape segregation on livelihood vulnerability: Moving from extensive shifting cultivation to rotational agriculture and natural forests in northern Laos. *Human Ecology*

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SOCIO-ECOLOGICAL ISSUES LANDSCAPE GOVERNANCE

■ Transformations of agrarian landscapes



Feintrenie L, Schwarze S, Levang P. 2010. Are local people conservationists? Analysis of transition dynamics from agroforests to monoculture plantations in Indonesia. *Ecology & Society*, 15 (4): 37.

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WHAT ARE THE PROSPECTS FOR CONSERVATION AGRICULTURE?

■ Need for alternative cropping systems

- in Indonesia, complex agroforests retain about half of the biodiversity, but converted to oil palm
- in 2005, the govt of Laos issued a decree that generalises the use of conservation agriculture
- no magic bullet → need to rethink and adapt research practices

■ Adapting innovations to a dual agriculture

- persistence of swidden agriculture in the uplands
- complex interactions between intensive and extensive systems
- complementary role of smallholder and agribusiness companies, public – private sectors

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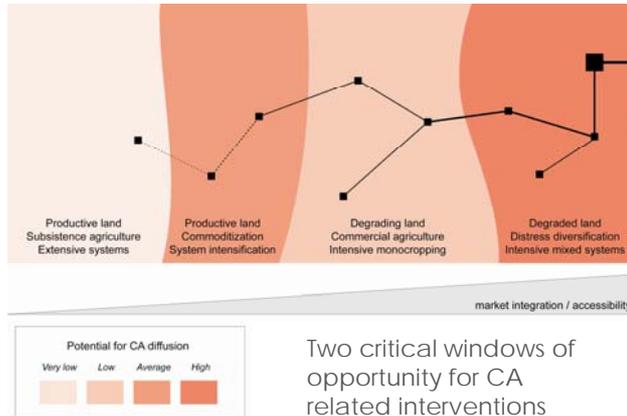
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WHAT ARE THE PROSPECTS FOR CONSERVATION AGRICULTURE?

■ Identifying windows of opportunity



Two critical windows of opportunity for CA related interventions

Lestrelin G., Castella J.C. (2011) Opportunities and challenges for the adoption of Conservation Agriculture in maize production areas of Laos. *Proceedings of the 5th World Congress on Conservation Agriculture*, 26-29th September 2011, Brisbane Australia, pp. 42-43.

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WHAT ARE THE PROSPECTS FOR CONSERVATION AGRICULTURE?

■ Identifying regularities in transition processes

- key moments for intervention along specific agro-ecological transition pathways
- trajectories repeat themselves in time and space → lessons can be drawn from the past experiences of neighbouring countries
- adapting intervention mechanisms to socio-ecological context (e.g. land tenure security)

■ Connecting actor-networks

- researchers, extension agents, farmers are not the only actors to be involved in innovation processes
- socio-technical systems can be transformed by combining bottom-up pilot experiments with top-down advocacy approaches
- collective actions aimed at designing more desirable futures (e.g. Landcare organisations)

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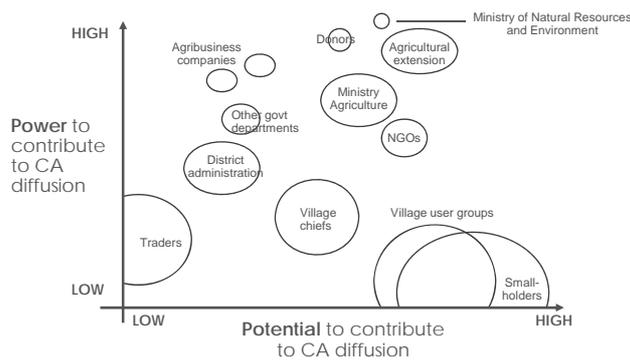
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WHAT ARE THE PROSPECTS FOR CONSERVATION AGRICULTURE?



■ Connecting actor-networks

- need to identify intervention mechanisms, dynamics of power relations, etc.



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WHAT ARE THE PROSPECTS FOR CONSERVATION AGRICULTURE?



■ Negotiating agro-ecological transitions

- inflections or bifurcations in land use trajectories are systematically linked with some kind of negotiation among stakeholders,
- the quality of the negotiation is determined by who takes part, the level and quality of information held by each stakeholder, and power relations,



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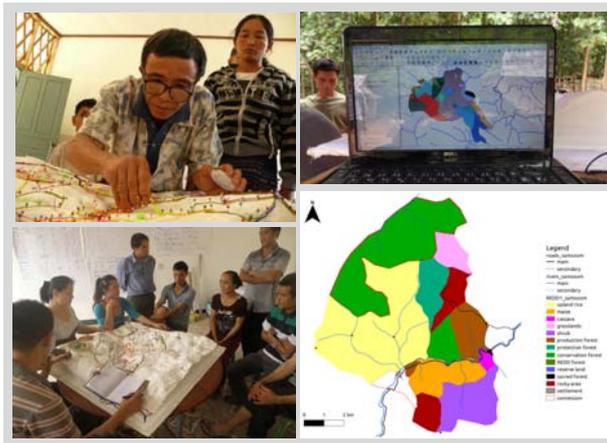
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WHAT ARE THE PROSPECTS FOR CONSERVATION AGRICULTURE?

■ Negotiating agro-ecological transitions



Bourgoin J., Castella J.C., Hett C., Lestrelin G., Heinmann A. (2013) Engaging local communities in low emissions land use planning: a case study in Laos. *Ecology and Society*



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CONCLUSIONS

■ Innovations for, with and by farmers to adapt to local and global changes require:

- to identify opportunity windows
- to design context-relevant intervention mechanisms
- to engage local communities in negotiating their own pathways towards Conservation Agriculture

