# Local knowledge and land degradation

## A case study in the uplands of Laos

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# Outline

- Background & Objectives
- Overview of the study site
- Land degradation:
  - ⇨ Scientific measurements
  - ⇨ Local perceptions
- Livelihood adaptations
- Discussion
- Conclusions

# Background

- According to global assessments of land degradation:
  - ⇨ 65% of the world's land resources are degraded to some extent. In Southeast Asia, 80% of the land is at least moderately degraded
  - ⇨ In Laos, 100% of the land is degraded with 84% of it moderately to very severely degraded
  - ⇨ Agricultural expansion and land use intensification are the main causes of land degradation

Sources:

- UNEP-ISRIC's Global Assessment of the Status of Human-induced Land Degradation (1991)
- ISRIC's Status of Human-induced Soil Degradation in South and Southeast Asia (1997)
- FAO's World Land Resource Report (2000)

# Background

- Large scale assessments are challenged by a growing number of micro-scale studies:
  - ⇨ Land degradation is scale sensitive
  - ⇨ Definitions of land degradation reflect particular perceptions, timeframes and value attachments
  - ⇨ Local populations may develop rapidly effective land conservation measures
- If local perceptions are not integrated, land degradation assessments provide only a partial overview

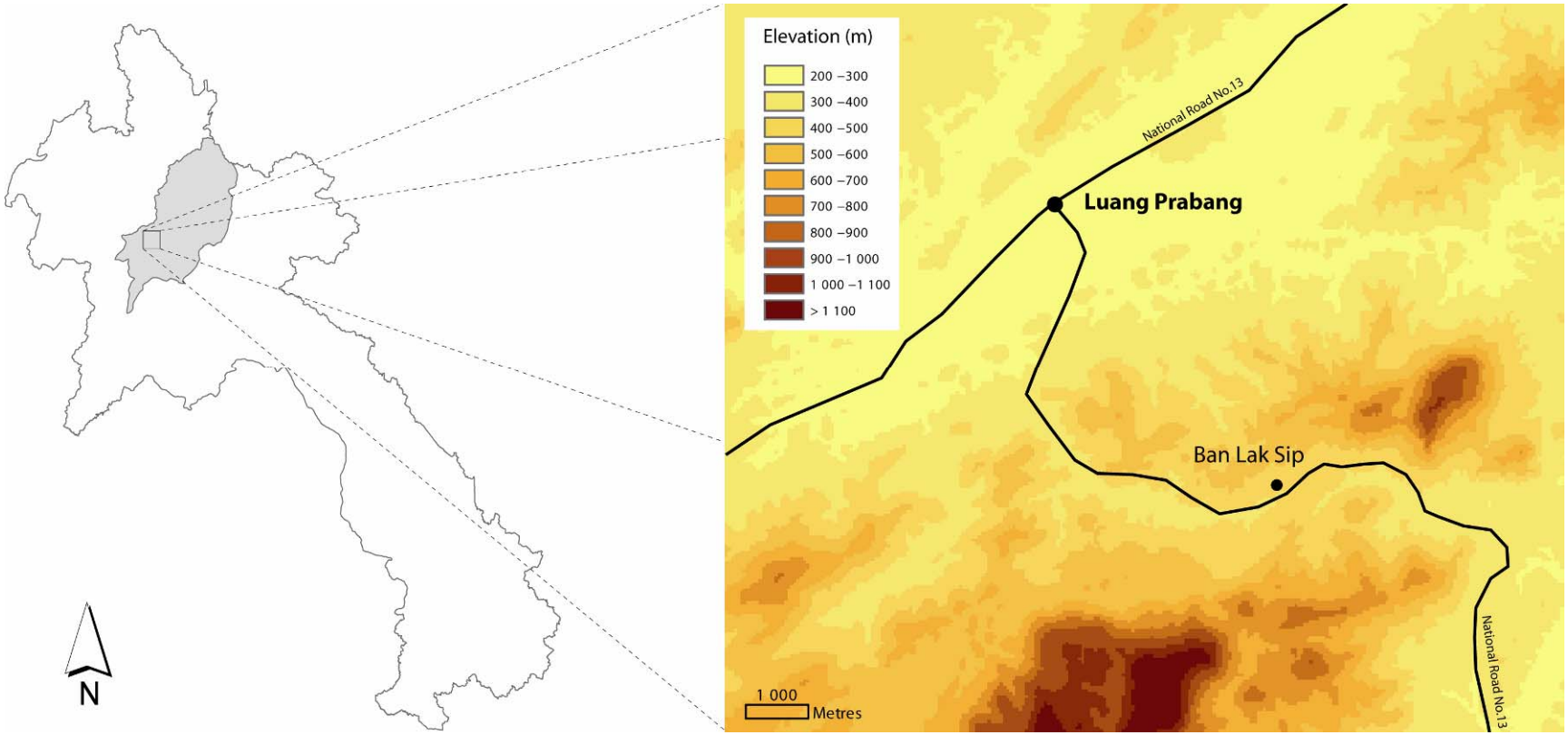
# Objectives of the study

(1)To highlight the convergences and divergences between scientific observations and local perceptions

(2)To identify local adaptations to land degradation

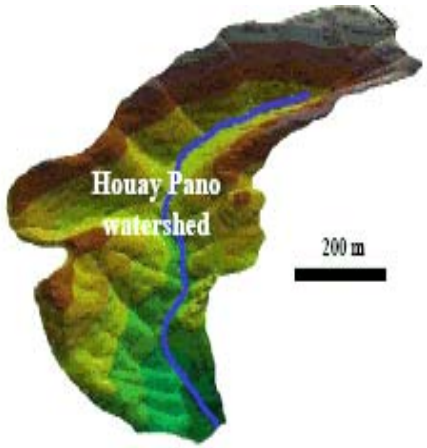
(3)To discuss the contribution of local knowledge to understanding and remediating land degradation issues

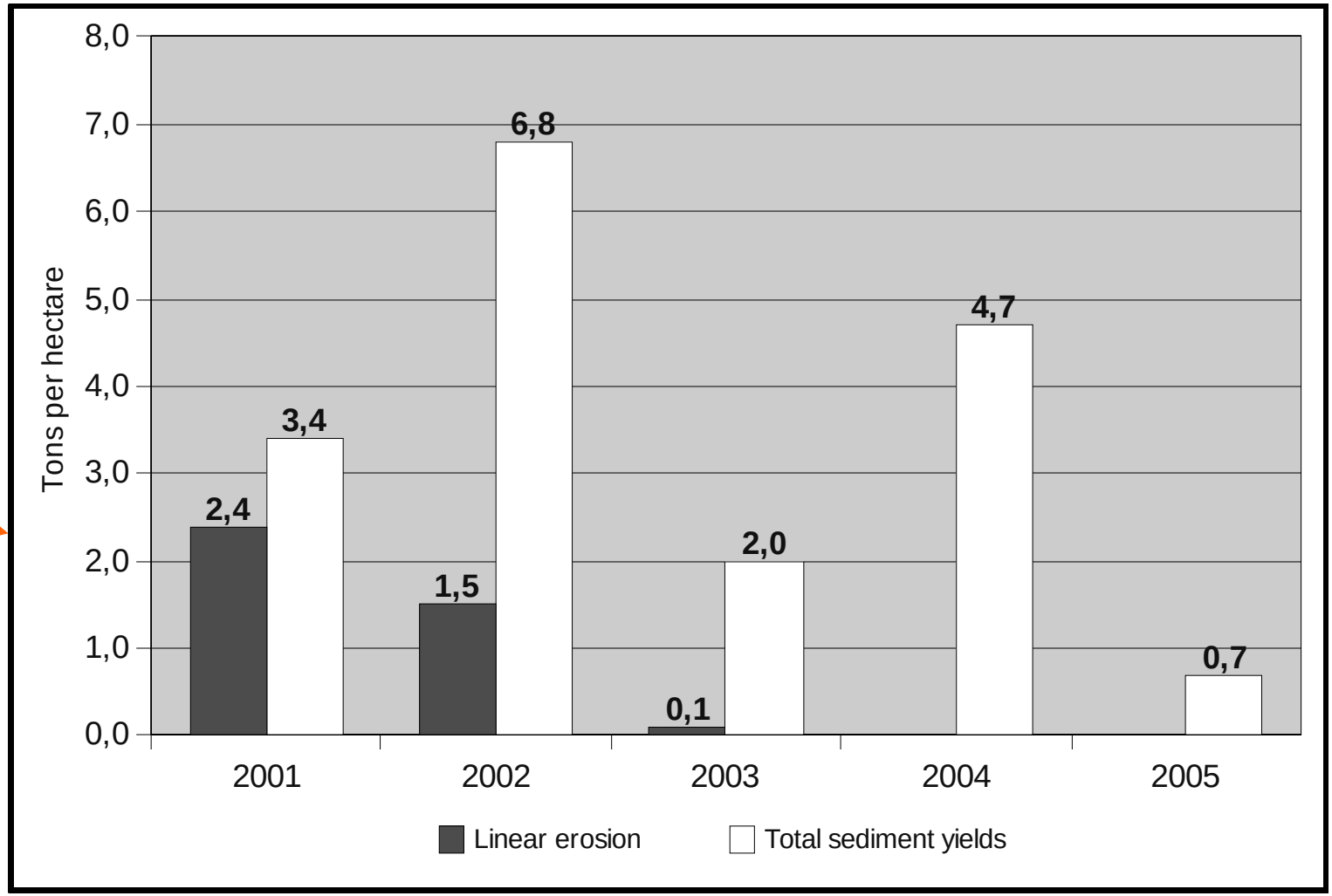
# Overview of the study site




# Land degradation: measurements

⇨ Important inter-annual variations in soil erosion rates



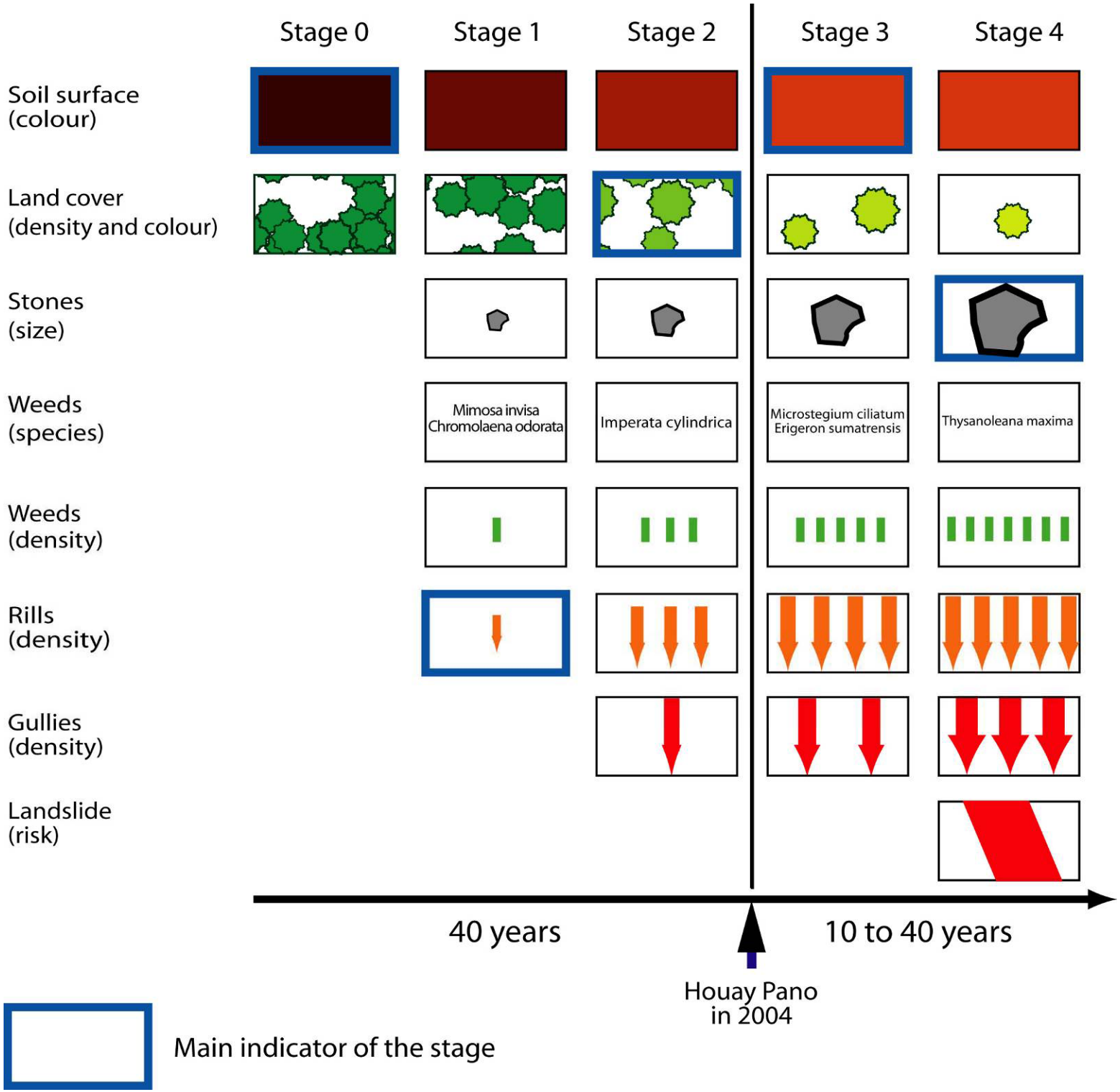



# Land degradation: measurements

- Identification of main drivers for soil erosion
  - ⇨ No significant correlations between erosion and annual or monthly rainfall amounts
  - ⇨ **Rainfall intensity** plays a major role in the generation of **linear erosion**
  - ⇨ Both **linear erosion** and **total sediment yield** correlate positively with the **extent of annual crops**
- Measurements provide only limited information on long term environmental change

# Land degradation: perceptions

- A shared perception of a continuous land degradation trend in the village
  - ⇨ **Annual cropping on steep slopes** and **shortened fallow periods** as the main causes of land degradation
  - ⇨ **Decreasing agricultural yields** and **increasing workload for annual cultivation** as the main consequences of land degradation
  - ⇨ Agricultural pressure will make **upland annual cultivation impossible in 10 to 40 years' time**


Stage 0
Stage 1
Stage 2
Stage 3
Stage 4
Soil surface (colour)
Land cover (density and colour)
Stones (size)
Weeds (species)
Mimosa invisa
Chromolaena odorata
Imperata cylindrica
Microstegium ciliatum
Erigeron sumatrensis
Thysanoleana maxima
Weeds (density)
Rills (density)
Gullies (density)
Landslide (risk)
40 years
10 to 40 years
Houay Pano in 2004
Main indicator of the stage

# Land degradation: perceptions

- Soil erosion rates: conflicting perceptions

| *Perceived trends* | *Attributed to* | *Percent of farmers* |
|---|---|---|
| Increasing rates | Increasing agricultural pressure<br>More intense rainfalls | 49 % |
| Unchanged rates | - | 22 % |
| Decreasing rates | Declining rainfall amounts | 29 % |

- Contradictions between measurements and perceptions:
  - ⇨ No major variations in rainfall intensities
  - ⇨ No clear decline in annual/monthly rainfall amounts
  - ⇨ No correlation between rainfall amounts and soil erosion

# Livelihood adaptations

- Livelihood diversification
  - ⇨ In 1990: 2-3 livelihood activities per household
  - ⇨ In 2003: 4-5 livelihood activities per household
- Development of alternatives to annual cropping
  - ⇨ Pig, goat and fish farming
  - ⇨ Market-oriented vegetable crops
  - ⇨ Teak and banana plantation
  - ⇨ Small trading and seasonal non-farm jobs

# Livelihood adaptations

- Different strategies:
  - ⇨ Diversification of on-farm activities
  - ⇨ Adoption of full-time non-farm occupations
- But a common cause:
  - ⇨ Development won't pass by an improvement of the annual cultivation system
  - ⇨ Upland annual cultivation must be replaced by less labour-consuming and more profitable activities

# Conclusions

- The results of this local case study do not contradict larger scale assessments of land degradation
- An approach integrating local knowledge can provide:
  - ⇨ a longer term perspective on land degradation dynamics and environmental change
  - ⇨ a better understanding of local land use strategies
  - ⇨ valuable insights for identifying “socially-acceptable” solutions to local land degradation issues

# Conclusions

- Contradictions between local perceptions and scientific measurements caution us from assuming that local knowledge is always on the mark
- Challenges:
  - ⇨ Development of research methodologies that allow a more informed and critical integration of local knowledge
  - ⇨ Creation of a “language” common to local populations and development agents for a better efficiency in development interventions

# Thank you!