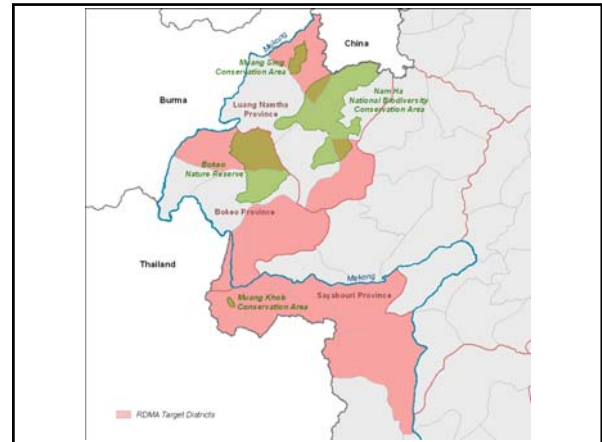


## Management of Bamboo Dominated Secondary Succession in the Context of Carbon trading and Rural Development in Northern Lao PDR

Pilot Activities and Research in the Lao-German Program Rural Development in Mountainous Areas (RDMA)



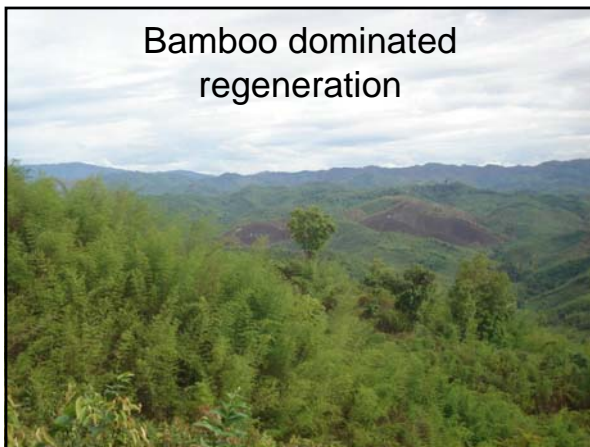
Shifting cultivation landscape



Clearing by fire for rubber cultivation



Bamboo dominated regeneration



### Major constraints for development

- Remoteness, limited road infrastructure
- Limited market access
- Average cash income levels between 150-250 \$ US per capita per year
- Limited access to health and education facilities
- Weak extension services
- Limited upland farming options

## Potential of Carbon trading in the context of rural development

- In RDMA areas high ratios (5-15 ha) of forest area per capita (country wide 3 ha/person)
- Carbon fixation potential 40 to 120 tons CO<sub>2</sub> per person or 200-600 tons CO<sub>2</sub> per family /year (5 pers/family)
- Potential (?) income levels through carbon trading regimes 1200-3600 \$ US per year and per family (6 \$ US/ton CO<sub>2</sub>)

## Issues of Carbon Trading Mechanism

- Government's willingness to accept rural population as an actor in the forest protection and carbon trading mechanism
- Percentage share of carbon credits on national and provincial level
- Transaction costs (monitoring)
- Absorption capacity for carbon payments on village level (productive investments, micro finance, baseline payments per person, social security fund)

Forest Carbon Sample Plot (15 years)

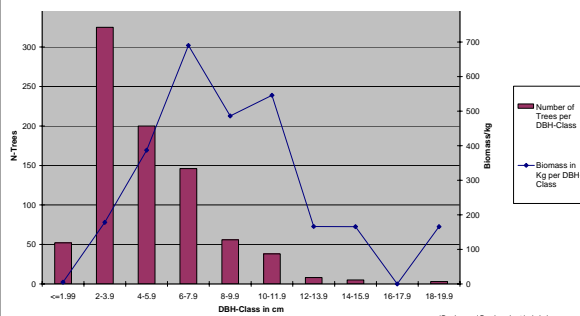


## Forest Carbon Sample Plots

### Results of first plot measurements Secondary forest at age 15 years

- Number of Stems : 5497 /ha
- Total volume of live trees: **84.5 m<sup>3</sup>/ha**
- Total volume dead trees: 78.5 m<sup>3</sup>/ha
- Total volume live/ dead bamboo: 20.5m<sup>3</sup>/ha
- Present annual carbon (C) stored in **live tree** biomass: **1.7 t /ha/year**
- Potential carbon storage (?) 4.0 t/ha/year

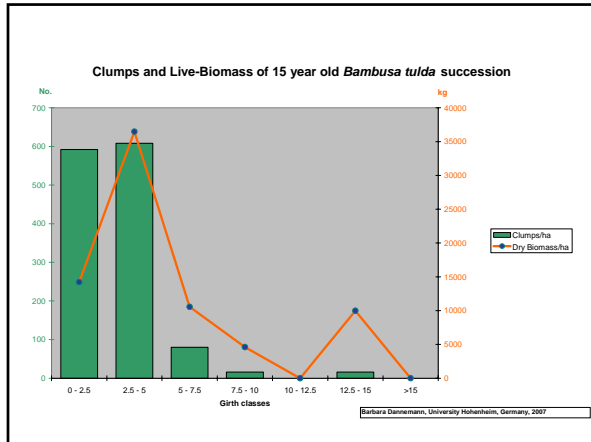
Diameters and Biomass of 15 Year Forest Plots



## Bamboo Sample Plots

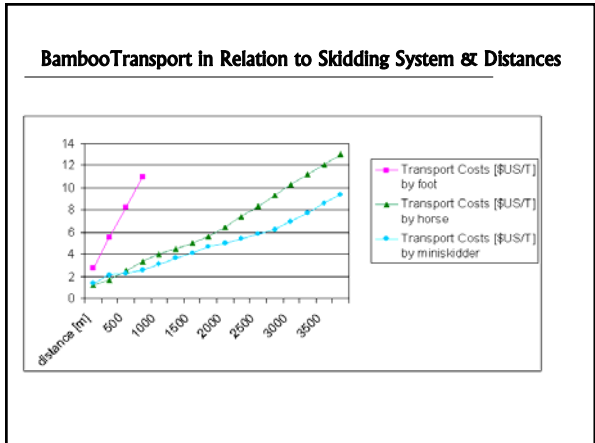
### Results of plot measurements in 15 year secondary bamboo succession

- Number of bamboo clumps: 1330 /ha
- Total biomass of live bamboo: 75 t/ha
- Dead standing and litter biomass: 140 t/ha



- ### Issues related to Bamboo
- Bamboo biomass dominates successional processes where multiple shifting cultivation cycles have taken place or cycles have become shorter than 5 years
  - Bamboo prevents establishment of tree succession (fire climax + smothering)
  - Bamboo creates an unmanageable fire danger (fuel loads up to 200 t/ha) due to flowering/ dieback in 15-25 years cycles
  - Permaculture issues of bamboo species (20 years) in the context of carbon mitigation

- ### Management Strategies and Open Questions
- Management goal of stable „permanent“ carbon stocks will require removal or at least control of bamboo biomass (live and dead) on industrial scale (50+ tons/ha)
  - Options for **biomass based power generation** (fuel chips), paper, charcoal, other industrial uses
  - Is the conversion into higher quality bamboo species possible ?
  - Appropriate harvesting methods and costs



- ### Rafting of Bamboo
- Construction time for a 3 ton bamboo raft is estimated at 3 man-days.
  - Transport distances of about 50 km will result in costs of about 6.5 \$ US per ton.
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