Sustainable forest management in Bosland
Summary of a PhD research in Bosland

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Whole tree harvesting could increase income from forest management by producing wood chips for bio-energy from harvest leftovers. We installed a large terrain experiment on 8 ha of pine stands in Bosland, where different machines were used to compare harvest strategies for whole tree harvesting.

- Despite considerable harvest losses, there is a large technical potential yield of wood chips from leftovers in these pine stands (8.4 fresh t/ha.y logs and 2.6 fresh t or 11 MWH/ha.y chips).
- However harvesting logs is much more beneficial than harvest of chips from leftovers. Total costs of harvest of wood chips almost equal resale prices. The economic potential of additional biomass of leftovers is thus limited, but new technologies, higher resale prices and upscaling could increase this potential.

Bosland is a rare example of a co-owned forest. With help of a literature review and in depth interviews with stakeholders we performed a transition analysis to describe the novelties in the Bosland approach. We found:

- A distinctive paradigm shift towards management for coherence.
- A long term vision that informs and guides the short-term action agenda.
- A bottom up approach, focusing on participation and co-creation.

Harvest of leftovers also means an increased export of several nutrients (N, K, Ca, Mg, P). We took extensive samples of different ecosystem compartments to estimate and model long term influence of current and additional harvest.

- Intensive whole tree harvesting depletes soil stocks of Ca, K and P and is thus unsustainable.
- Situation is bad due to high N deposition, poor soils and if a short rotation period is applied.
- Sustainable potential of additional biomass harvest is very limited.

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