Scaling Sustainable Modernisation in Mountain Agriculture: Agroforestry Experiences in Kaule, Mid-Hills of Nepal

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Background
- Steady agricultural intensification in Nepal in recent years
- Especially cash crops (potatoes, vegetables, fruits) are increasingly cultivated
- Intensification threatens upland farming systems → loss of biodiversity, soil degradation
- Challenge in Kaule: implementation of agroforestry (AF) as modernized, sustainable land management practice for a fair use of resources

Objective
- Analysing modernization process in mountain agriculture
- Presentation of scientific findings and summary of the experiences during the transition to sustainable land management from an interdisciplinary perspective
- Hypothesis: after several years of implementation and project activities achievements along the pathway to sustainable modernization can be quantitatively and qualitatively evaluated by means of ecological, economic and social indicators

Methods
- Structured & semi-structured interviews on socio-economic and ecological issues
- Diffusion of innovations assessment: explains the reasons for adoption and rate of diffusion of new ideas and technologies within a community (Rogers 2003)
- Backcasting as transition management method to define future visions
- Comparative analyses of soil properties of AF, C, T agrosystems
- Comparative vegetation mapping of AF, C, T agrosystems

Livelihood generation
- Households with smaller land size wanted to transform larger land portions to AF
  → Stronger wish to diversify income generating strategies

Diffusion of innovations assessment
- After 5 years, out of 15 initially participating farms 6 farms successfully established agroforestry, 4 farms had limited success, 5 left the project and 20 more joined.
- Many of the distributed plants did not survive, mainly species previously unknown to farmers in Kaule
- Minimized risk due to only partial conversion of total farm area
- Labor intense process in the beginning, later reduced workload

Evaluation of 10 factors that can affect the course and speed of the diffusion process:
→ Potentially severe intricacies during the adoption process
→ Capability for enhancing livelihood security rather high
→ Potential for diffusion: very appropriate innovation with a great potential to spread throughout a village community like in Kaule

Backcasting
- Agroforestry system would incorporate main envisioned changes of farmers (more trees, better water management, new markets)

Study area
- The mountain village Kaule, 25 km north-western of Kathmandu, in the mid-hills of Nepal
- Current agricultural land use in Kaule comprises three agrosystems:
  i) Fully developed agroforestry system (AF): adopted in 2001
  ii) Transition system (T): adopted in 2009 on 15 farms
  iii) Conventional system (C): characterized by mono-cropping and dependency on fertilizer and pesticides

Soil analyses
- Significantly better soil quality in AF than in C systems

Vegetation mapping
- Significantly increased species richness and ground cover at AF fields

Summary & Conclusion
- Participation of all social groups in all stages of project planning and implementation is of key importance for project success
  → Creating identification with the project
  → Incorporation of local knowledge
- Backcasting is a suitable method to include all social groups
- Adoption of AF → evidence of:
  ▪ Increased willingness to implement sustainable agricultural practices
  ▪ Obtaiment of environmental benefits
  ▪ Livelihood security
  → Contribution to sustainable modernization processes in mountain agriculture

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