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"Bridging the gap between increasing knowledge and decreasing resources"

Transition to Agroforestry in the Mid-Hills of Nepal: Implications for Livelihoods and Environment

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Abstract

Agroforestry, the purposeful cultivation of trees and crops in interacting combinations, is receiving increasing attention as a sustainable land management option. In Nepal, where farming systems are still largely conventional, further extension of agroforestry practices is needed to counteract unsustainable agricultural intensification. Farmers are increasingly encouraged to adopt agroforestry farming systems. Kaule e.V., a Nepalese-German NGO for socially sustainable agro-projects, initiates and supports the transition to agroforestry practices in Kaule village, Nuwakot District. In addition, Kaule e.V. conducts concomitant scientific studies aiming at analysing the transition process from social and natural sciences' perspectives. A detailed actor and social network analysis, embedded in the methodologies of transition management and backcasting, revealed a profoundly differentiated disposition of local farmers to adopt more resilient and sustainable lifestyles and income generation in the long term. After the adoption of agroforestry practices, soil quality and soil productivity has been significantly ameliorated, with positive effects appearing shortly after the conversion from conventional monocropping systems. Significant differences in soil pH, exchangeable aluminium content, base saturation, electric conductivity, organic matter and nitrogen content, and cation exchange capacity indicate more favourable soil properties and more fertile soil conditions in agroforestry soils. Field experiments showed that fallow legumes have the potential to restore degraded terrace soils by biomass accumulation and nitrogen fixation. Species richness and diversity of trees, shrubs and herbs is significantly higher in agroforestry systems. Categories of alpha and beta diversity show distinctly higher levels only two years after transition. Results of a market evaluation and survey indicate a high potential of income generation by organic cash crop cultivation (kiwi fruit, cardamom, asparagus) within agroforestry systems. In conclusion, the adoption of agroforestry practices contributes to natural resource and socio-economic sustainability by meeting subsistence requirements, increasing land productivity, providing other ecosystem goods and services, and improving economic conditions and livelihood security of households.

Keywords: Agroforestry practices, income generation, social network analysis, soil fertility, species diversity, sustainability

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