Understanding diverse adaptation pathways to support agroforestry transition in northwestern Vietnam

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Abstract

Agroforestry systems offer potential to restore degraded land, enhance agrobiodiversity and improve smallholder livelihoods, especially in resource-constrained upland regions in Northwestern Vietnam. However, their widespread adoption is hindered by both farm-level constraints and broader structural barriers which highlight the need for tailored support that addresses diverse needs. To inform the design of inclusive and context-responsive interventions, we employed a participatory approach to develop a farm typology capturing the heterogeneity among agroforestry farmers. Using data from 101 households and applying archetypal analysis, we identified three distinct farmer archetypes, each characterised by different land use patterns and livelihood strategies. Archetype 1 (A1) and Archetype 2 (A2) represent small-scale farms with limited agricultural labour but differ in land structure and use: A1 farmers manage consolidated plots and optimise labour and land through diversified agroforestry systems, while A2 farmers face high land fragmentation, which restricts system diversification. Archetype 3 (A3) includes farmers with the largest landholdings and more available labour, who primarily rely on annual cash crop production for their livelihood. These farmers show the lowest agroforestry adoption and moderate species diversity in their systems. We used these archetypes in participatory discussions with farmers to co-identify targeted interventions that foster sustainable agroforestry transitions. Strategic needs include improving market access, providing financial and input support, and establishing irrigation systems. Practical actions involve diversification of agroforestry systems and enhancing technical capacity. Drawing upon archetype profiles and their specific needs, we explored potential socio-technical solutions, as well as challenges and opportunities for implementing these solutions. By integrating farm-level diversity into planning and intervention design, our study provides insights into varied farmer behaviours and strategies, ensuring that proposed solutions are both practical and locally relevant.

Keywords: Agroforestry, archetypal analysis, farm typology, participatory research

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