

Forage innovations for resilient livestock systems in Northwest Vietnam

Atieno, Mary¹; Dao, Thi Thu Hang¹; Do, Trong Hieu²; Bui, Van Tung²; Tran Thi Bich Ngoc³; Triana Ángel, Natalia¹; Pazos Cárdenas, Mateo¹; Bravo, Aura¹; Duncan, Alan⁴; Peters, Michael¹; Burkart, Stefan¹

¹International Center for Tropical Agriculture (CIAT), Colombia; ²Northern Mountainous Agriculture & Forestry Science Institute (NOMAFSI), Son La, Vietnam; ³National Institute of Animal Science (NIAS), Hanoi, Vietnam; ⁴International Livestock Research Center (ILRI), University of Edinburgh, UK

Contact: s.burkart@cgiar.org

Introduction

- Livestock production is vital for livelihoods in Northwest Vietnam but is constrained by seasonal feed shortages and poor forage quality.
- Smallholder farmers face limited access to quality seed, extension services, finance, and markets.
- Improved tropical forages can enhance livestock productivity, resilience, and livelihoods.
- Scaling remains limited due to persistent technical, socioeconomic, and institutional barriers.

Objectives

Evaluate the agronomic performance and farmer acceptance of improved forages.

Analyze adoption patterns, barriers, and enabling factors across different systems.

Identify practical strategies for scaling through gender-responsive and participatory approaches.

Methodology

- **Study area:** Mai Son District, Son La Province, Vietnam.
- Synthesis of evidence from two CGIAR research-for-development projects: Li-chăn (2017–2021) and Chăn-henh (2022–2024)
- **Mixed-methods approach combining:** Gendered Feed Assessment Tool (G-FEAST), demonstration plots and participatory on-farm trials, adoption surveys and qualitative interviews, farmer preference evaluations (Tricot), capacity-building assessments, and forage seed system analysis
- More than **230 farmers** participated in feed diagnostics and co-design activities, **194 evaluated improved forage** varieties on-farm. **42 qualitative adoption interviews**. Capacity development with **>1,000 farmers**.
- Farming systems were classified as **Type A** (intensive lowland), **Type B** (mid-altitude mixed), and **Type C** (remote upland); C subdivided into C1 and C2 based on differences in livestock and crop management intensity (Figure 1).

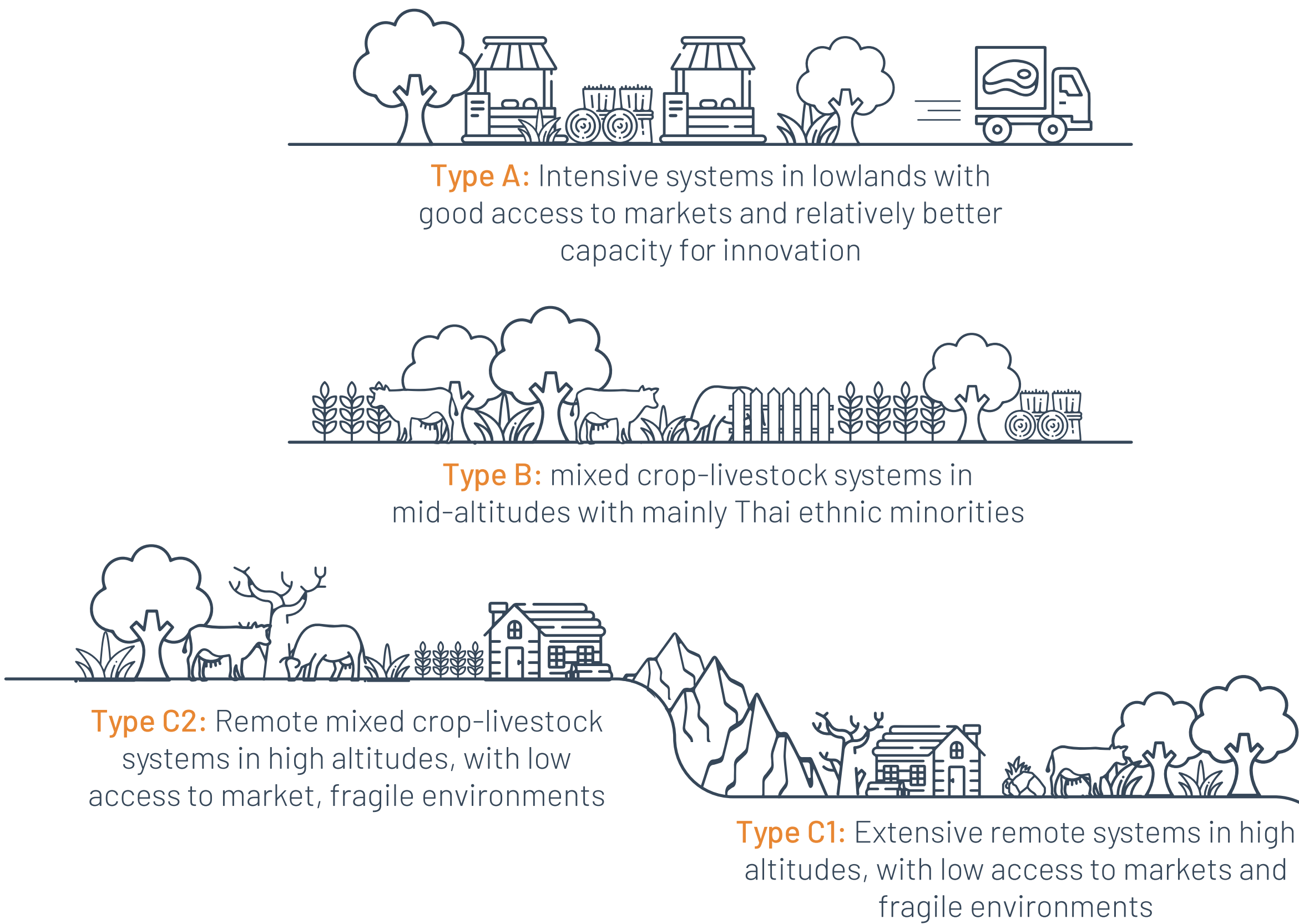


Figure 1. Classification of farming systems.

Results

Improved forage performance

- High-yielding grasses (e.g., Green Elephant, Mun River, Mombasa) substantially improved year-round feed availability. Mulato II demonstrated strong drought tolerance
- Legumes provided complementary benefits but showed lower productivity and adoption

Adoption and farmer benefits

- **155 households** adopted at least one improved forage variety
- Green Elephant represented approximately **50%** of total forage area established
- Average forage area expanded by **17–67%**, with the largest increases among remote upland farms (Type C)
- **Farmers reported:** improved animal health, better dry-season feeding, reduced labor for feed collection (i.e., for women), increased livestock productivity

Capacity building and scaling

- **34** farmer trainings reached **1,183** livestock producers and benefited **5,670** people (Figura 2)
- Strong involvement of public sector, including financing
- **32** local extension staff trained through Training-of-Trainers
- Participation reached **98.5% attendance** with high satisfaction

Key barriers to scaling

- Limited availability of certified forage seed and fragmented seed systems
- Poor access to finance, particularly among remote ethnic minority households
- Uneven extension coverage and language barriers restrict technology dissemination
- Legume species showed lower productivity and adoption than improved grasses



Figure 2. A session of Training of Trainers about forage establishment and management.

Discussion and Conclusions

- Improved tropical grasses are technically suitable for upland livestock systems and effectively address seasonal feed shortages.
- Participatory research, co-design, and farmer-led evaluations increased local relevance and adoption.
- Gender-responsive approaches reduced women’s labor burden and improved access to innovations.
- Long-term scaling depends on strengthening: local seed systems, extension services, farmer organizations, public-private partnerships, inclusive financing mechanisms
- Technology alone is insufficient; enabling institutional environments are equally important.
- **The Vietnam experience** provides a scalable model for resilient livestock development in mountainous smallholder systems across Southeast Asia and similar tropical regions.

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Related work

Atieno et al. (2026). Advancing forage innovations in upland livestock systems in Vietnam: Lessons from the Northwest Highlands. doi: [10.1002/uar.2700329](https://doi.org/10.1002/uar.2700329)

Pazos-Cardenas et al. (2026) Gender dynamics in Vietnam’s forage seed system: barriers, opportunities, and empowerment pathways. doi: [10.1080/21665095.2026.2678258](https://doi.org/10.1080/21665095.2026.2678258)

Orduz Ramos et al. (2026) Livelihoods, livestock and local logics: Unpacking farmer group dynamics in Vietnam’s Northwest Mountainous region. doi: [10.1332/27523349y2026d000000086](https://doi.org/10.1332/27523349y2026d000000086)

Burkart at al. (2025) Seeding solutions: Closing the ruminant feed gap through forage innovation in Southeast Asia. doi: [10.1002/cft.270072](https://doi.org/10.1002/cft.270072)

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