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Feeds and forages intervention strategies for improved livestock nutrition and productivity in the Northwest Highlands (NWH) of Vietnam

Atieno, Mary; Bùi, Van Tung; Phan, Huy Chuong; Trần, Thi Bich Ngoc; Mai, Thanh Tu; Duncan, Alan; Douchamps, Sabine; Peters, Michael

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Livestock-led interventions towards equitable livelihoods and improved environment

Objective: To stimulate system transformation (livelihoods, environment, equity, and market access) to empower highland farming communities through bundled livestock-based interventions in North-West Vietnam.

- system and landscape approach
- integrated interventions: [feeds & forages](#), genetics, animal health, environment and livelihoods
- multiple species: cattle, buffalos, pigs
- community-based
- reaching ethnic minorities
- embedded in governmental plans

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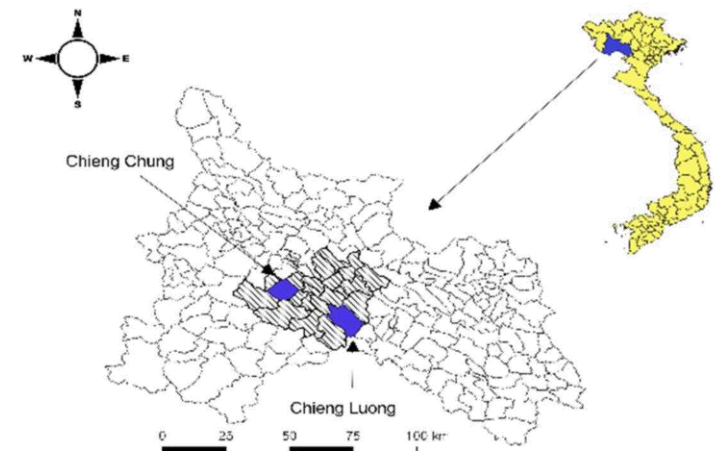


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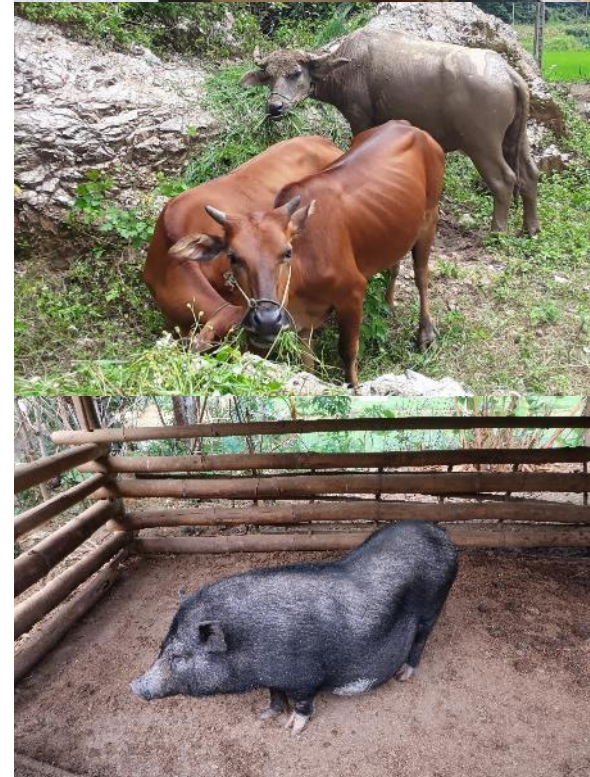
Farming system types

- Study area located in 2 communes (Chieng Chung and Chieng Luong) in Mai Son district, Son La province, NWH Vietnam
- Different farming systems types:
 - Intensive systems in the lowlands with good access to markets and better capacity for innovation (**Type A**).
 - Mixed crop-livestock system in the mid-altitudes, mainly Thai ethnic minorities (**Type B**).
 - Remote extensive systems in the high altitudes, with low access to market, fragile environment, mainly H'Mong ethnic minorities (**Type C**).



The context: feed-related challenges in NWH Vietnam

- **G-FEAST**: assessment on local feed resources, availability, challenges and design of context-specific intervention strategies
- **Cattle and buffalos** mainly fed native pastures, stall feeding using crop residues and free grazing on communal land and forests.
- Winter feed shortage, poor diets, low yield and quality of available forages.
- Limited knowledge on improved forages, feed processing and preservation.
- **Bản pigs**: low productivity but well-adapted to local harsh conditions; mainly fed with rice bran, corn, banana trunk, vegetables, and leaves.
- Study objective: assess locally suited feed intervention strategies for cattle and pigs, for improved animal nutrition in Mai Son district, Son La province.



Integration of improved forages

- 4 grasses and 3 legumes selected for their high-yielding, high quality, and drought tolerant properties.
- Farmer-led trials with 155 households, trained on establishment, management and utilization.
- Different ways of forage integration depending on the system and farmers' preference
- Data collection: germination rate, height, biomass yield, and farmer preferences, dislikes, challenges.

Category	Variety	Scientific name
Grasses	Mulato II	<i>Urochloa</i> hybrid cv. Mulato II
	Mombasa guinea	<i>Megathyrsus maximus</i> cv. Mombasa
	Ubon paspalum	<i>Paspalum atratum</i> cv. Ubon
	Green elephant	<i>Cenchrus purpureus</i>
Legumes	Ubon stylo	<i>Stylosanthes guianensis</i> var. <i>guianensis</i> cv. Ubon stylo
	Pinto peanut	<i>Arachis pintoii</i>
	Rice bean	<i>Vigna umbellata</i>



Improved forage varieties



Mulato II



Mombasa Guinea



Ubon paspalum



Ubon Stylo



Rice bean



Pinto peanut



Green Napier

- ~ 25 ha were planted with improved forages across the 6 intervention villages.
- Increased average area with forages per HH: from 0.01 ha to 0.06 ha.
- Highest preference for 3 grass varieties (Green Napier, Mombasa Guinea and Ubon paspalum) due to high germination rate, biomass, palatability. Moderate preference for forage legumes (Ubon stylo, rice bean, pinto peanut) and Mulato II.

Capacity building on forage utilization and feed technologies

- 145 farmers (70 men and 75 women) in 6 villages trained on feed processing and preservation, better utilization of crop residues, and feed formulation.
- **Cattle/buffalo:** feed classification, diet proportions/feed mix, feeding regime, feed processing (silage preparation and treatment of rice straw with urea).
- **Bản pigs:** feed classification, diet formulation/feed mix, feeding regime, feed processing, feed fermentation using probiotics.



Farmers' perceptions through photovoice

- A participatory M&E tool to document change stories from farmers' perspectives.
- Stories featured in a virtual exhibition - Livestock Development in Vietnam from Artists' and Farmers' Perspectives - in collaboration with the Vietnam Fine Arts Museum (<https://bit.ly/3BylpGr>).
- Farmers gave own reflections on benefits of improved forages and feed technologies e.g. increased forage yield, feed availability, high preference of silage, increased weight gain, challenges.



Photovoice stories: Examples

“My wife is going to cut grass in our field about 100 meters from home. It often takes her about 30 minutes. This is Guinea grass provided by the (Li-chăn) project for trial planting. In addition to rice bean, we grow 3 varieties of grass: Mombasa guinea, Green elephant and Mulato II. We have harvested 17 kilograms of Mombasa Guinea grass, 15 kilograms of Mulato II grass and 35 kilograms of green elephant grass on an area of four-square meters. Rice bean is planted to harvest its foliage for feeding the cows. The productivity is satisfactory. The chopped rice bean and green elephant grass are accepted by the cattle. The stem of Mombasa guinea grass is too hard for them, but they can eat the leaves. I plan to plant more Green elephant and Mombasa guinea grass next year because they are tall and easy to harvest.”

Narrator and photographer: Lương Văn Dũng (Thai ethnicity)



<https://livestockpanorama.ilri.org/en/livestock-development-farmers-perspective/ff23-story-dung>

Person in the photo: Lương Thị Liên (Thai ethnicity)

Photovoice stories: Examples

"I am feeding pigs with fermented banana stems mixed with a little bran. Previously, I did not feed them with the mixture of banana stems and bran, and the pigs were skinny. Since I joined the Li-chăn (project's) training, the pigs have grown rapidly and healthily as I feed them with the mixed bran."

Narrator: Quàng Thị Thuấn (Thai ethnicity, 31 years old)

Photographer: Quàng Thị Nương (Thai ethnicity, 12 yr old)

Person in the picture: Quàng Thị Thuấn (Thai ethnicity, 31 years old)

<https://livestockpanorama.ilri.org/en/livestock-development-farmers-perspective/ff8-story-thuan>



Challenges

- Low preference for forage legumes due to low germination, slow growth, tendency to be outcompeted by weeds, low biomass yield and low palatability.
- Forages harvested when too young and fed in large quantities to animals caused digestive complications as young leaves and stems contain high water content.
- When left in the field for long periods before harvesting, the biomass became too hard for the animals to eat.
- Despite being trained feed formulation, almost all farmers tended to feed their cattle with one forage variety at a time. This led to livestock not quickly getting used to eating new and improved forages.
- Some techniques such as silage preparation are labor intensive requiring several steps and materials
- If farmers did not apply the recommended rate and proportion of raw materials, the silage quickly went sour and cannot be stored for long period.

Conclusion

- Adoption of high-yielding, high-quality, improved forages can increase feed availability, livestock productivity and efficiency.
- Better animal nutrition can be achieved through better feed formulation and feeding regimes.
- Winter feed shortage can be reduced by preserving forages and crop residues for use in the dry season.
- Good feeding practices also improves animal health and breeding performance.
- Capacity building on forage technologies and strengthening the role of stakeholders in seed systems can ensure seed access and availability, knowledge exchange and act as a driver for scaling.



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Thanks!



Mary Atieno Otieno, Scientist
mary.otieno@cgiar.org

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