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Report on Li-chăn stories of change
Evidence from photovoice



Vietnam, December 2022

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Patron: Professor Peter C Doherty AC, FAA, FRS
Animal scientist, Nobel Prize Laureate for Physiology or Medicine–1996

Box 30709, Nairobi 00100 Kenya
Phone +254 20 422 3000
Fax +254 20 422 3001
Email ilri-kenya@cgiar.org

ilri.org
better lives through livestock

ILRI is a CGIAR research centre

Box 5689, Addis Ababa, Ethiopia
Phone +251 11 617 2000
Fax +251 11 667 6923
Email ilri-ethiopia@cgiar.org

ILRI has offices in East Africa • South Asia • Southeast and East Asia • Southern Africa • West Africa

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Abbreviations and acronyms

AI	: Artificial insemination
CIG	: Common interest group
LLAFS	: Livestock Livelihoods and Agri-Food Systems

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Background

Li-chăn was a project under the CGIAR Research Program on Livestock which aimed at providing research-based solutions to drive smallholder farmers transition to sustainable and resilient livelihoods and to more productive small-scale enterprises that would help feed future generations. Vietnam was selected as one of four priority countries to consolidate research from different disciplines and translate it into a pilot with flexible combinations of integrated interventions from 2019 until end of 2021.

The project aimed at stimulating system transformation through bundled livestock-based interventions in North-West (NW) Vietnam, covering the areas of livelihoods, environment, equity, and market access to benefit highland farming communities.

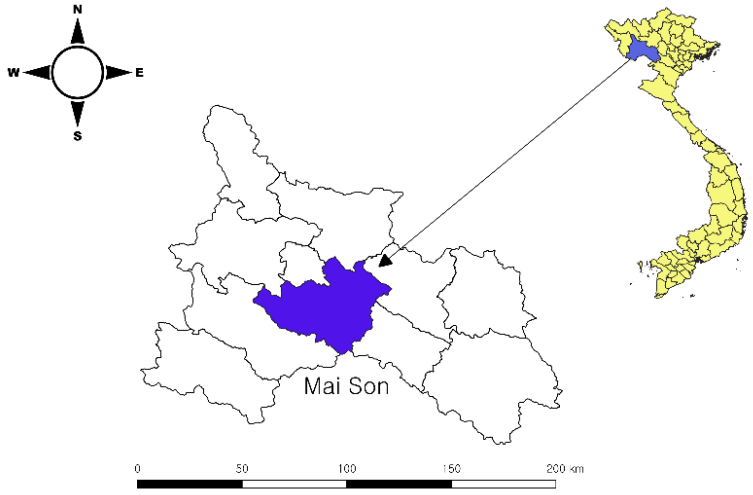


Figure 1. Li-chan project sites

In the northwest of Vietnam, over 94% of the land was classified as sloping, of which 87% had slope above 25°. The region was home to 30 different ethnic groups with distinct languages, traditions and farming practices. An estimated 80% of the population depended heavily on agriculture for their livelihoods (Lua et al., 2017).

Son La was the largest mountainous province in the northwest of Vietnam. The population consisted of 12 ethnic groups, comprising 55% Thai, 18% Kinh, 12% H'mong, 8% Muong and 7% others. The poverty rate was 20%[1] (GSO, 2022).

The project site was Mai Son district, which offered a diversity of farm types, from grazing and extensive systems at the top of the mountains to intensive farms with strong crop and livestock integration at the bottom of the valleys, with a variety of socio-economic and ecological conditions. They are characterized in three types (A) intensive system with good access to market and relatively better capacity for innovation; (B) mixed crop-livestock systems and (C) remote extensive and semi-extensive system with low access to market. Two communes selected for the project were Chieng Chung and Chieng Luong. The interventions were tailored to three types of farming systems. In Mai

[1] 2016 poverty lines are VND 630,000 and VND 780,000 for rural and urban areas respectively, GSO website: www.gso.gov.vn

Son district, Li-chan is piloted in six villages: Mon 1, Mon 2 (Type A); Oi, Khoa (Type B) and Buom Khoang, Xam Ta (Type C).

Table 1. Characteristics of the six intervention villages

Villages	Ethnicity	Number of households	Poverty rate (%)	Distance to Commune People Committee (km)	Highest altitude	Accessibility
Mon 1 (A)	Thai	154	6	0	970	(High) The village is about 6 km from Co Noi market. Most of the road are all-weather road and easy to access.
Mon 2 (A)	Thai	154	5	0	970	
Oi (B)	Thai	112	9	5	1000	(Medium) There is 1.5 km soft surface and steep road to the village.
Khoa (B)	Thai	203	4	1.5	1300	(Medium) Part of the village road remain soft surface. To enter the village, there is a spring with a simple wooden and robe bridge.
Buom Khoang (C)	Hmong, Thai, Kinh	37	89	8	1100	(Low) There is about 7 km soft surface and steep road to the village. There are two spring crossings on the way to the village. In rainy weather, the village can be isolated for several days. No electricity as of December 2022.
Xam Ta (C)	Hmong	19	84	8	1700	

Source: People Committee of Chieng Chung, Chieng Luong and key informant interviews conducted by the author in February 2020.

Li-chan conducted a wide range of interventions in 2020-2022 around five flagships:

- Animal Genetics: Farmer training on livestock breeds and breeding; Piloting of artificial insemination in project sites for cattle and *Bản* pigs
- Animal Health: Farmer's training on animal health and biosecurity; Capacity building of animal health professionals (e.g. introduction of diseases, sampling, outbreak investigations, data recording and vaccine/drug use).
- Feeds and Forages: Gendered livestock feed assessment to design context-suited feed and forages interventions; Piloting of improved forage varieties and livestock feeding practices in target sites including capacity development with farmers and support agencies.
- Livestock and Environment: Comprehensive Livestock Environment Assessment for Improved Nutrition, Secured Environment and Sustainable Development (CLEANED) Tool to evaluate the intervention impacts on the environment; Identification of optimal nutrient management options at farm level; Capacity building of extension staff in nutrient management; Awareness raising on environmental issues (nutrients, greenhouse gases and water).
- Livestock and Livelihoods: Market research to assess potential demand for high value livestock products; Participatory identification of suitable value chain interventions at farm and market levels; Establishment of common interest groups.

What is photovoice?

Photovoice, or storytelling through photos, is a participatory method which uses photography to enhance dialogues and discussion. Community members are given cameras to take photos of concerned topics. It was first developed by Wang and Burris in 1997 based on the theoretical literature on education for critical consciousness, feminist theory and nontraditional approaches to documentary photography (Wang, 1999).

According to Wang and Burris, photovoice is a powerful medium not only for women but also other socially stigmatized status or people who do not read or write in dominant language. Researchers, community groups and photovoice facilitators have used the photovoice method in many different settings and with diverse populations: women (Wang 1999; Havelock 2007; Krieg 2008; McIntyre 2003; Willson et al. 2006 in Palibroda et al. 2019); youth (Strack et al. 2004; Wang 1999; Chanse et al. 2016; Whitney 2006); homelessness (Wang et al. 2000); indigenous and ethnic minorities (Castleden et al. 2008; Krieg 2008; Cam et al. 2019; iSEE 2012; Oxfam in Vietnam & iSEE 2013; Oxfam in Vietnam, iSEE and SIDA 2014 & CARE 2017); sexual minorities (STAR-II project, Hanoi School of Medical 20122; iSEE 2014). In Vietnam, the method was first used in 2002 in a project "The world through the lens of Hmong children", whose participants were Hmong girls selling souvenir and working as tour guides in Sapa town. It was used widely by NGOs and research institutes as a tool to explore issues faced by disadvantage people, such as the ethnic minorities, children, informal workers, single mothers, disable and LGBTIs (Giang 2014; Ha et al. 2014). Among CIGAR centers, ICRAF used photovoice as a tool to document the climate change experience of farmers in Vietnam for SIPA project in 2020[3].

In Li-chan's photovoice project, 20 user-friendly cameras were given to 18 farmers (three in each village) and two commune veterinarians in late June 2021. We did not use individual smartphones as many ethnic minority farmers still did not have smartphones. If they had, the photographs did not have high resolution. During June – September 2021, there were three monitoring trips to each village.

A photovoice project consist of five steps:

- Step 1: Selecting community members (June 2021)

In this step, the project officer gave an introduction on the photovoice project, including:

- Objectives of the photovoice project. In the context of Li-chan photovoice, farmers would take photos of all livestock-related issues, from which they could identify how they traditionally raise livestock and how they have changed with the project interventions.

- Responsibilities and compensations for the photovoice participants

- Activity timeline

Then each village nominated two - three members to be focal points. The nominated participants are often dynamic people who are entrusted by the villagers. There were six Hmong and twelve Thai ethnic participants from six villages, of which 10 men and 8 women. In fact, the photovoice facilitator encouraged to have one more female Hmong participants but the husband insisted that he participated instead of his wife as Hmong women normally could not drive. He was also worried that his wife did not speak much Vietnamese. The photovoice facilitator still asked that both husband and

[2] Documents of the training course on "Qualitative approach and theories in HIV/AIDS research" by Columbia University, Hanoi Medical University & Institute for Family and Gender Studies in 2012

[3] https://ccafs.cgiar.org/news/worth-thousand-words-using-photovoice-document-climate-change-experiences-farmers-vietnam

wife could use the camera as we had illiterate participants in previous photovoice projects. In the end, only the husband used it.

- Step 2: Training on using camera and conducting interviews, storytelling (24-25 June 2021)

Training on Photovoice includes two parts: (i) photographic techniques, and (ii) asking questions related to the photos, the latter of which is related to the in-depth interview research method.

(i) Training on photographic techniques:

- How to use a camera: As most of the ethnic minority farmers neither use a camera nor a smartphone camera, they need to be trained. After being trained, they should know how to turn on the camera, take photo and view taken photos. Last but not least, they should know how to charge the camera and insert the battery.

- Dos and Don'ts with cameras: To reduce the number of broken cameras when implementing the project

- Techniques for taking photos: How to take a beautiful photo. The most important elements in a photovoice project are framing the shot and rule of thirds. The photovoice facilitator should avoid technical advice and let the participants develop their creativity.

(ii) Asking question related to the photos:

In this step, the photovoice facilitator instruct the photographer to prepare a list of questions. These should be open-ended and specific.

In "Photovoice: A Participatory Action Research Strategy Applied to Women's Health", Wang (2009) suggested questions spelling the acronym SHOWED: - What do you See here? - What is really Happening here? - How does this relate to Our lives? - Why does this situation, concern, or strength Exist? - What can we Do about it?	Another mnemonic, PHOTO, is used in some photovoice project: - Describe your Picture - What is Happening in your picture? - Why did you take a picture Of this? - What does this picture Tell us about your lives? - How can this picture provide Opportunities for us to improve life?

The SHOWED can be used by photographers to interview the people related to the photo, while the PHOTO acronym can be used for the photovoice facilitators to ask the photographers. However, depending on the objective of the photovoice project that the questions can be modified. In Li-chan photovoice, we added questions on livestock practices before and after the project interventions to identify stories of change.




Photo: Photovoice training in Chieng Luong commune

- Step 3: Coaching and selecting photos and stories (June – September 2021)

From June – September 2021, the photovoice facilitator paid three visits to the community. In each trip, the photovoice facilitator copied the photos and selected the photos together with the photographers. They wrote the stories and decided on additional information to collect for the stories. During the trips, the photovoice facilitator also coached the villagers on camera use and photographic techniques.

In total, 20 photographers produced about 4800 photos and 170 stories from late June to early September 2021.




Photo: Photovoice monitoring trips in Buom Khoang and Xam Ta village

- Step 4: Validating with communities (September 2021)

In this step, the photovoice facilitator instructed the photographer to present selected photos and stories to the community for validation. They decided on formats to present the results. Posters and photo album are common ways of presenting photovoice results. A literature exploring the use of photovoice as a research methodology to identify and explore community health and disability priorities revealed that more than half of photovoice projects (17/29) had exhibit of photos (Hergenrather et al. 2009). In some previous photovoice projects with the ethnic minority groups, the participants also present photovoice stories in forms of art performances such as poem, dance or play.



Photo: Photovoice validation workshop in Chieng Chung commune

- Step 5: Presenting results

In Li-chan's photovoice project, the results were presented in 30 posters in four exhibitions in Chieng Chung, Chieng Luong communes, Mai Son district and Son La city with the attendance of policy makers at different levels. The photo and stories are also put together in a catalogue "Livestock Development in Vietnam from Artists' and Farmers' Perspectives" and in a virtual exhibition[4].





Photo: Photovoice exhibition and photo album

Why photovoice?

For Li-chan, photovoice was used as a community-based M&E tool with Thai and Hmong farmers in the intervention villages. Photovoice is proved to be a suitable participatory method with the ethnic minority communities in Vietnam through series of projects that use photovoice methodology:

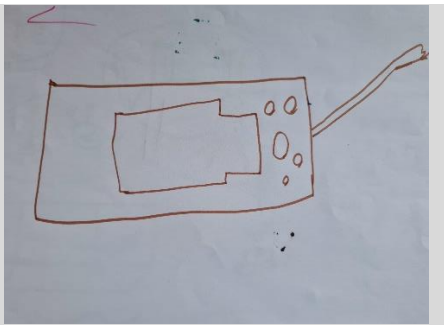
- *My Culture* (iSEE, 2012): 64 photovoice authors belonging to nine ethnicities. This is the first project in Vietnam using photovoice method with ethnic minorities in Vietnam.
- *Hey Friends! Listen Up* (Oxfam, iSEE and SIDA 2014) and *I love stone plateau* (iSEE & Plan International 2016) are two photovoice projects with the ethnic minority children. These two projects together with the *My Culture,* are exploratory with no specific research topics.
- Collaborative research with ethnic minorities in Lao Cai and Dak Lak (conducted by iSEE in 2013 in Giang 2014; iSEE and SDC 2014) and collaborative research on community issues through the lens of ethnic minority women (CARE International and iSEE 2017): In collaborative research, photovoice is used to identify issues, as evidence and to reach policy makers through exhibition, workshops and publication.
- In their research, Cam et al (2019) used photos and the accompanying stories of the K'ho in Pa village to analyze the changes in management and access to forest resources.

Photovoice is a suitable method with the ethnic minorities for several reasons:

- The photovoice is a lively way to engage community. In all photovoice project, photographers expressed their eagerness to actively participate in the activities.
  "This is the first time I hold a camera. I am eager." (In a monitoring trip in Chieng Luong commune)
  "It was fun when villagers saw me, they called me "Hi, photographer". (In a monitoring trip in Chieng Chung commune)

[4] https://livestockpanorama.ilri.org/en/livestock-development-farmers-perspective

"I draw this camera to say that I am happy to be given a camera to take photo of interesting things and learn new things through talking with the person in the photo about what they are doing" (Quang Thi Ly, Female, Thai ethnicity)



- Photos can help to overcome language barriers: Even though most Thai farmers can speak Vietnamese, the elderly cannot speak the language fluently. In Hmong communities in Chieng Chung and Chieng Luong, only men and young women can speak Vietnamese. In photovoice, the interviewers are Thai and Hmong farmers, who speak the community language. In this aspect, they have more merits than the Kinh ethnic researchers who do not speak the language. This methodology does not require that community participants can read or write. In some previous photovoice projects (e.g. Right and Voice by iSEE and CARE International, Co-research in Sapa by iSEE and Oxfam), there were illiterate participants.

- Photos can provide lively and stimulating evidence: The photo themselves are trustworthy evidence of the changes. People can use photos to document and visualize their lives and practices. The audiences also see that these are real events that did happen in real place.



Pinto peanut after one month



Pinto peanut after two months

Photo: Pinto peanut in the same garden by Thao Thi Ganh (female, Hmong)

- Photos can be used to stimulate communities' discussion: The stories accompanying the photos are importance sources of qualitative data. There are several kinds of interviews either between the photographers and the people related to the photo or between the photovoice facilitators and the photographers. Additionally, there can be facilitated photo discussion sessions among the photographers and other community members. Photo discussion allows participant to share and discuss the photos they tool and stimulate dialogues about the concerned topics.



Photo: Photo discussion session in Chieng Chung commune

- Through participating in photovoice project, capacity building of community photographers (or can be called 'co-researchers' in some community-based participatory action research) in photography, participatory research techniques and public speaking, is achieved. They are also given opportunities to voice out their needs, concerns and what works for them. This process also helps the ethnic minorities to gain confidence. Ethnic minorities are widely portrayed as lazy and backward by the media, which reinforces public perceptions. Participatory collaborative research using photovoice rejects these negative stereotypes by placing equal value on the knowledge, skills and experiences of ethnic minority people and researchers. In this photovoice project, farmers said that they felt as if were professional photographers, agronomists or researchers participating in the process.

- The photovoice process can trigger social change. The community participants are empowered with skills to advocate for their own communities. They are enabled to reach to policy makers and influential advocates through poster exhibition or their participation in relevant forum and workshops. This process increases their ownership in measures that help improving their situation. When Li-chan project employ community-based M&E, farmers will see with their eyes and hear with their ears what interventions work for them. This will help to facilitate the adoption and scaling out of best-fit interventions among farmers in the community. The photovoice outcomes can also reach further with its influences on policy makers. A policy maker confirmed to plan for increasing livestock heads and cultivated forage area in the local socio-economic development plan basing on the information from photovoice exhibition.



Photo: An exhibition in Chieng Chung commune

Besides, from the knowledge gaps identified from the photovoice stories, Li-chan's Feeds and Forages flagship prepared and distributed manuals on how to grow and feed cattle and pigs with new forage varieties introduced by the project; Genetics flagship addressed some knowledge gaps in artificial insemination in a workshop in October 2021; Environment flagship also used some photovoice stories and exercises in their reports on nutrient flows in crop-livestock systems[5].

When working with the ethnic minorities, photovoice methodology enables the researchers and community members to become co-researchers and co-learners through equitably sharing of knowledge and experience, overcoming the language barriers. In M&E of an integrated livestock development project, it can help to provide evidence of best-fit interventions in forms of photo and stories. It also helps to trigger wider adoption among community farmers and even further through reaching and influencing program, policy makers and society.

Other considerations

Informed consent

As photovoice is a research activity involving human subjects, it requires institutional ethics review and approval. Moreover, as photovoice involves the participants taking photographs of others, this requires another informed consent. For this photovoice project, we used two kinds of consent forms:

> (i) informed consent to participate with the photovoice participants: In this consent form, it should be clear to the potential participants about the activity objective, their voluntary participation, potential benefits and harms. The participants can withdraw from the participation anytime they want without being penalized.
>
> In Li-chan photovoice, there are no big risks except for their time, being exposed to Covid-19 during photo discussion session and extreme weather in Son La province during June – September 2021. The meetings were kept under 30 people and organized in accordance with Son La province and ILRI's Covid-19 prevention regulations. In the case there are storms, the participants do not have to go out to take photos or conduct interviews. It was also added in this consent forms that we would mention the author's names when they want to use the photos. Any interview quotes or photos taken are credited and can only be used with the

[5] https://cgspace.cgiar.org/bitstream/handle/10568/116063/211108%20-%20Nutrient%20flows%20Li-chan%20-%20Final-edit.pdf?sequence=1

consent of the authors, interviewees and those who appear in the photo (or their guardians in case of children under 18 years old). As Li-chan photovoice involved photos on livestock production, it did not contain any sensitive photos.

(ii) informed consent to waive their rights to photos and interview quotations with photovoice participants and the ones in the photos, answering the photographers' interviews or participating in the photovoice discussion: For this, we use ILRI's Consent Form on Photography/Video/Audio Use for Human Subjects. This form indicated that the person agreed that photographs and quotations of them can be published and disseminated, and that he/she had the rights to ask ILRI to remove their photographs or quotations anytime.

However, there were some sensitive stories (e.g. regarding corruption) told to the photovoice facilitator but were not allowed to publish. We did not publish this information but could still use it anonymously.

Li-chan photovoice obtained institutional approval from ILRI Institutional Research Ethics Committee.

Compensation

Monetary stipend: In this photovoice project, we paid a stipend of VND 1,500,000 (equivalent to USD 65) to each participant, to compensate for their time participating in training, meeting, discussion and taking photographs for three months.

Non-monetary compensation: In some previous photovoice project, non-monetary compensation was offered in forms of giving cameras and memory cards to community participants. In this photovoice project, we took the cameras back at the end of the project to use in other future photovoice projects in accordance with ILRI and CIAT's property management regulations. However, we gave the community photographers printed posters, pictures and an exhibition collection catalogue.

Li-chan's Theory of Change

The overall objective of Li-chan project is to stimulate system transformation (livelihoods, environment, equity, and market access) to empower highland farming communities through bundled livestock-based interventions in north-west Vietnam. The interventions are tailor-made to different households depending on their locations in the landscape and livestock species that they owned. They are done through identifying, testing and evaluating bundled livestock-based interventions, improving knowledge and skills in animal husbandry, increasing awareness of environmental degradation; identifying institutional innovations that stimulate local livestock product development, market linkages and effective service delivery for a sustainable commercialization, benefiting equitably all gender and ethnic groups; and promoting inclusive policy dialogue at different levels that lead to more conducive and effective policy attention to smallholder crop-livestock smallholder systems.

Outputs of the project includes 10 trainings for farmers, animal health professionals and service providers; 155 farm trials; 15 demonstrations; workshops and surveys conducted. Short-termed outcomes of the project are changes in knowledge, attitude and skills of farmers and veterinarians on livestock husbandry and awareness raising of farmers and decision makers on environmental issues. Medium-termed outcomes are adoption of the livestock innovations by farmers and veterinarians and increased understanding of decision makers on livestock development and environmental issues. Long-termed impacts will be increased productivity and contribution of livestock to household income; better support and service delivery from animal health professionals; and use of research results by decision makers in formulating and implementing policies. As this photovoice project was carried out

one year after the interventions were implemented, it only covered short-term and, to a certain extent, medium-term changes to farmers and veterinarians.

Short-term changes: Changes in knowledge, attitude and skills

- Farmers (both male and female) shows changes in knowledge, attitude and skills on:
  - breed and artificial insemination
  - confinement of animal
  - biosecurity
  - improved feeding
  - environment degradation
  - from domestic use to for sale
- Agricultural extension workers and animal health professionals improve knowledge and skills on:
  - artificial insemination
  - improved feeding
  - biosecurity and diseases diagnostics

Medium-term changes: adopting interventions

- Farmers an extension workers adopt flexible combination of customized intervention, including:
  - Improved forage, feed preservation
  - Planting cover crop, grass contour, making compost
  - Farm management and biosecurity
  - Artificial insemination
- Animal health professional diagnose animal diseases correctly more frequently

In the next phase of evaluation analyses, the project attributions will be analyzed according to the theory of change.

Stories of change from photovoice methodology

In total, 20 photographers produced about 4800 photos and 170 stories from late June to early September 2021. The photo are diverse many themes, covering all flagship activities, and also other themes such as road condition, labor division, crop production (which were mapped under LLAFS flagship) and culture.

Photo themes

(Only relative classification as some stories were related to more than one theme)

- Genetics (21 stories): challenge and opportunities of AI, cattle and buffalo breeds, pig breeds, *Bản* pig preference
- Animal Health (28 stories): demo-farm establishment, risks of grazing and necessity of confined stable, vaccination, disinfection, roles of local vets, keeping diary
- Feeds and Forages (71 stories): improved forages, time constraints of grazing and collecting forages, preparation of silage, probiotic feed mix and urea-treated straw
- Livestock and Environment (18 stories): intercropped with legume, grass contour, erosion, use of manure, composting, use of residues, participatory nutrient flows in livestock-crop system
- Livestock Livelihoods and Agri-Food Systems (29 stories): role of livestock as saving, productivity of white pig, market difficulties due to road accessibility, role of children and women in livestock production, CIG establishment
- Culture (9 stories): food, handicraft and traditional equipment

Many stories show integration and are related to more than one themes:

- Genetics & Feed and Forage: fat of *Bản* pigs
- Genetics & Animal Health: AI helps reducing diseases transmission
- Feeds and Forages & Livestock and Environment: forages grown along contours to prevent erosion
- Animal Health & Feed and Forage: role of improved forage and feed preservation in confining
- Animal Health & Genetics & Environment: animal confining to prevent parasites, animal death due to accidents, in-breeding, and burning or cutting down forests to create room for pastures
- Genetics & LLAFS: markets, economic efficiency of *Bản* and cross-bred pigs
- Animal Health & Environment: farm management & manure composting

Example of a photo story that referred to more than one theme (Animal Health and Feeds and Forages)



"This is the cow shed in Sồng A Chứ's house. In the village, there are only two households who have cows in enclosures. The shed was built in April 2021. Chứ's family does not let cows graze in the forest like many other households in Xam Ta village because they are afraid that the cows will fall down cliffs and die. In 2016 and 2017, the family lost five cows for this reason, and they therefore had to confine their cows at home.

Between March and November, the cows are locked up until 10 a.m., and then they are herded until 5 p.m. Rice is growing in the fields at this time of the year so the cows need to be watched, otherwise they will damage the rice paddies. For the remaining months of the year, the cows are locked up in the evening and graze around the fields during the day.

Currently, there is not enough grass. I can only cut some along the roadside and in the fields, so I have to herd them. Sồng A Chư and Sồng A Vụ, who are the only two households with confined cows, own 18 cows in total. Chứ has five cows and the rest are owned by Vụ. They take turns to herd the cattle to save labour in both households."

Narrator: Sồng A Chứ, male, Hmong, 25 years old
Photographer: Sồng A Tráng, male, Hmong, 23 years old

Genetics theme

Changes in knowledge and attitude on improved breeds

There were many stories whose narrators compared the benefits of hybrid breeds to local ones. The hybrid breeds were reported to be bigger, grow faster and have more lean meat.

"They are born after but sold before the local black pigs. After 3-4 months, a white pig can reach 100kg but the Bản pigs only reach 70-80kg after 10 months" (Female, 27 years old, Thai ethnic)

"A Sind cattle still have more meat and is more productive" (Male, 31 years old, Thai ethnic)

Despite these facts, most farmers still expressed their preference of *Bản* pigs. According to them, *Bản* pigs tasted better and could sell at a higher price. Additionally, farmers mainly raised pigs for household consumption, so they did not need high productivity. Another reason was that smallholder farmers often had diverse farming and livestock activities, so they could only take care of maximum 6-8 pigs. They thought because the price of white pig was lower, they had to grow them in large scale to make profit. In several stories, farmers also said that they did not have to buy concentrate for *Bản* pigs. They just feed them with self-produced maize or collected forages. Thus, hybrid varieties mean more investment to them.

"*"At first my wife was not fond of hybrid pigs because they require a large investment, while their meat price is low"* (Male, 31 years old, Thai ethnic)

Preference of *Bản* pig

"This are my mother's pigs. They are *Bản* pigs. People here prefer *Bản* pigs to white pigs as we are more familiar with *Bản* pigs. Their meat tastes better and price is higher. Thai ethnic people can't raise white and high lean meat pigs because we grow rice and we have upland field as well. For white pigs, we have to buy more concentrate and we had to raise a lot to have profit. *Bản* pigs fat is normally 10 cm thick though."



Photographer: Luong Thi Dung, female, Thai ethnic
Narrator: Luong Thi Dung, 24 years old and Ha Thi Duc, female, 68 years old, Thai ethnic

After Li-chan interventions of providing *Bản* pig crossbred with *Duroc* and local cattle with *Red Brahman*, farmers could see that it reduced in-breeding and the hybrid ones are bigger and grow faster. Especially, the crossbred *Bản* pigs were still black. The Feeds and Forages flagship also provided trainings on balanced nutrition to reduce fat proportion in *Bản* pigs and make them grow faster.

Faster growing hybrid breed

This is a photo of my pig giving birth to six beautiful, healthy and fast-growing piglets. The Li-chăn project supported me with artificial insemination for my pig. The piglets were born at the end of May and weighed almost 10 kilograms after more than a month. In the future, I want to select this breed for insemination but don't know where to do it. All my neighbours are asking to buy my piglets but I want to keep them.



Photographer and narrator: Quang Thi Thuan, female, Thai ethnic, 31 years old

<u>Changes in knowledge and attitude on AI</u>

Li-chan only conducted AI for pigs and cattle in Type A and B village, where the systems are intensive and animals are confined. In extensive and semi-extensive system (Type C), we could not control if the cattle or pigs were pregnant from AI.

It was reported in several stories that farmers still had concerns regarding AI.

- Worries that conducting AI would affect the reproductive system of the female pigs

"I am trained to collect Bản pigs' semen and can do it, but I have never conducted artificial insemination before. People don't like AI because they are afraid that AI will affect the reproductive system of the female pigs". (Female, Thai ethnic, 27 years old).

- Local breeds were small, while the exotic breeds were big, thus would cause birth difficulties. Farmers believed that AI could only be performed on *Bản* pigs which gave birth at least once.
- AI cattle services are limited and expensive (450,000 VND; 20 USD)
- For direct mating, farmers only had to pay after the pigs get pregnant (150,000-200,000 VND; 7-9 USD); However, they would have to pay for semen and service provider fees for AI, not knowing if the pigs would get pregnant or not.
- Concerned that AI would cause defects in animals:

"Li-chan staff conducted AI on a pig in the village. When it gave birth, all except for one were dead. Some didn't have ears. Some didn't have a tail. It was strange. The only one left was small, too". (Female, Thai ethnic, 21 years old).

Genetics flagship staff explained that this was because the mother sow had had blue ear disease before. This was difficult to control; unfortunately, it made some farmers reluctant to apply AI. The flagship explained the reasons and consequences to veterinarians in a workshop in October 2022. However, in a monitoring survey in December 2022, both farmers and village veterinarians still expressed this concern again.

- Preference for *Bản* pig breed

"I bought pigs semen at Cò Nòi market to conduct artificial insemination for my pig. The result was four piglets, but they turned out to be white even though I wanted to get black pigs. I don't know why" (Female, Thai ethnic, 31 years old)

This however could be solved with selection of semen for AI. Using Duroc, the cross-bred ones would still be black. The Genetics flagship gave farmers some address in Mai Son district where they could buy Duroc semen.

- Access to quality AI inputs and equipment

With pig AI, the main difficulty was access to quality pig semen.

"After joining AI training, I performed AI on one of my pigs but it did not get pregnant. [Li-chan] project staff conducted AI on two of my pigs, they were not pregnant either. All the sows in my village that the project conducted AI for did not get pregnant" (Female, Thai, 24 years old).

Unfortunately, semen bought at the above-mentioned provider in Mai Son district given by the project was not good. The reason might be it was not properly stored at the recommended cold temperature. In one AI round in Mon village, no cases were successful due to semen quality.

Regarding cattle AI, potential service providers had difficulties with buying nitrogen bottles to store bull semen. The price for a 15-litre bottle was about 9 million VND (equivalent to 410 USD) and it required regular refill of nitrogen. They would need to bring the bottle 20-40km to refill the bottle. Li-chan encouraged potential service providers to mobilize funds from both private and governmental sources. According to article 29 of Decree No. 83/2018/ND-CP on agricultural extension, farmers in the mountainous areas are eligible for support of 70% of the cost for equipment. The potential AI

service providers, commune agricultural extension staff and Mai Son Agricultural Service Center had to be active in applying for this fund.

"With technical support from the [Li-chan] project, I want to provide AI service for pigs and cattle. However, I still have difficulties buying nitrogen bottle and bovine semen straw." (Male, Thai ethnic, 41 years old).

Before project interventions, several households in Mon 1, Mon 2 and Khoa villages already knew about AI and conducted AI on white pigs before. After Li-chan project conducted trainings on breeding and AI, farmers knew more about the estrous cycle of pigs. They also understood the benefits of AI on pigs and cattle and learnt that it works for the local breeds. Farmers mentioned the following benefits of AI on pigs in different photovoice stories:

- Do not have to choose or buy the boars of the wanted breeds
- Do not have to transport the boar
- Besides paying the fee for renting a boar, they would have to feed it during the mating period
- Less time consuming: they would not have to wait for the pigs to "make acquaintance". In some cases, the sows refused to mate.

"When the female pig was estrous, I called people to carry the boar to my farm. However, the boar could not perform. The female pig bite it. So I had to call them to take the boar back and wait for the next estrous cycle." (Female, Thai ethnic, 25 years old)

- Can take advantage of the positive genetic traits: the animal would be bigger and grow faster. Many households used the same boar, leading to reduced genetic fitness.
- Safer for farmers as sometime the boar is aggressive
- Reduce disease transmission, especially when there was African Swine Fever outbreak in Mon village

Benefit of AI compared to direct mating



"With direct mating, it is difficult to transport the boars. The boar is a big male, and I had to ask for help to load him in a vehicle and put him in a pigsty. My husband was not at home, so it was very difficult for me to carry him. It costs 150,000 dong (7 US dollars) for pig mating services. If most people in the village use the same boar, then it will lead to in-breeding. It takes a lot of time to choose the breeding boar for direct mating. Then the two pigs have to be familiar with each other, so the boar can only be returned the following day. Artificial insemination only takes 10–20 minutes. Artificial insemination is hygienic and free from infectious diseases. For direct mating, as I am not the owner of the boar, I am not sure if I can clean him."
Photographer: Quàng Thị Ly (Female, Thai ethnic, 21 years old)
Narrator: Quàng Thị Ly, Lèo Thị Xiền (Female, Thai ethnic, 31 years old)

Adoption of AI

Genetics flagship conducted training on AI on pigs for farmers in four type A and B villages, namely Mon 1, Mon 2, Khoa and Oi. AI on cattle training was provided to veterinarians, agricultural extension officers because it was much more technical. Even though some farmers already knew about AI on pigs and performed it before the project intervention, AI on cattle was new to them. No one in the four villages had conducted AI on their cattle before. Only one Thai female farmer had seen a YouTube video on AI.

After some AI trials of cross-bred pigs and cattle in the four above-mentioned intervention villages, farmers saw with their own eyes that AI also worked for the local breeds, and it had many benefits. For AI on pigs, several farmers already could apply on their pigs or the neighbours' pigs.

"I conducted AI on my pigs and two of my neighbors'. They all got pregnant."

Seeing benefits of AI on cattle



"Lo Thi Chiem's calf was conceived through artificial insemination and was born nine months and 10 days later. It was exactly nine months and 10 days because the household noted the date the artificial insemination was conducted. The calf is just two days old but it looks like a normal three-to-four-month-old calf. The family was extremely happy. They wish to use artificial insemination techniques on both their cows and pigs. Their neighbour thought the same having seen that the hybrid calf was bigger, more beautiful and grew faster."
Photographer and narrator: Luong Van Yeu, male, Thai ethnic, 46 years old

Adoption of AI on *Bản* pigs



"This is my sow, who is a local pig. This type of pig is the most commonly raised by the villagers. At the moment, there are few local male pigs and the risk of inbreeding is high because they often mate with the sows in the village. As such, I chose artificial insemination instead of direct mating for my pigs. Previously, I did artificial insemination for my sows, but only for white pigs. Since I took part in the Li-chăn training on artificial insemination, the results have been much better. My sow gave birth to 15 piglets, with 12 of them growing very well.
After coming out of the womb, the piglets must be wiped clean from the tip of the nose, mouth and ears to the feet to ensure that they can breathe normally. After that, the umbilical cord must be tied and cut, followed by cutting the fangs so that the piglets don't hurt the mother's udder when they suckle. These steps must be done quickly so that the piglets can breathe well and get colostrum from the mother. It is very important for the piglets to receive colostrum from their mother because it contains a lot of nutrients with antibodies that increases immunity, enabling the piglets' immune systems to develop as much as possible. After giving birth, the sow should be fed with nutritious food."
Narrator: Lèo Thị Xiền, female, Thai ethnic, 31 years old
Photographer: Hà Văn Chung, male, Thai ethnic, 35 years old

Animal health theme

In general, photo stories cover all animal health interventions

- Use of disinfection (4)
- Use of vaccine (4)
- Mineral stone (4)
- Disease diagnostics (4)
- Farm management (5)
- Keeping diary (2)
- Role and difficulties of local veterinarians (5)

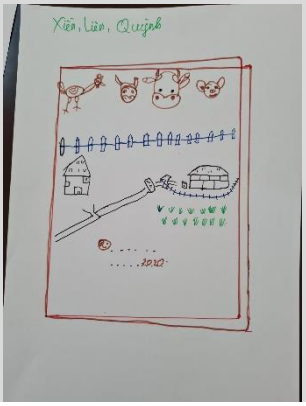
Among the most significant change stories that the facilitator asked the villagers (including photovoice participants and other Li-chan participants) was to tell the stories of their most significant changes from Li-chan through drawings, dough or any other craft works but no writing. There were two stories referred to animal health theme: mineral stone use and keeping livestock diary.

"For the first time, I know what a mineral stone was. Right after seeing it, all the cows were eager to lick it. In the past, they could only lick the floors. This kind of stone contains minerals, helping the animals stay healthy, grow fast and look beautiful. Other villagers have been excited to see the mineral stones working so well with my cattle and plan to order them for their own cattle."



Narrator and photographer: Leo Van Quan, male, Thai ethnic, 36 years old





"It is my first time taking notes in a livestock diary. I record the purchase of a sow and piglets, use of veterinary drugs, pigsty cleaning, disinfectant spraying, people coming in and out, and accounting entries. Everything is noted here. Livestock production and crop farming involve economic calculations. I am aware of periodic injections. For example, I inject one dose of foot-and-mouth-disease vaccine every six months and one dose of parasite removal 10 days later."

Drawing by Leo Thi Xien, female, Thai ethnic, 31 years old
Narrator: Leo Van Quan, male, Thai ethnic, 36 years old

Changes in knowledge and attitude on biosecurity measures

Farmers and veterinarians understood the importance of using disinfectants, vaccines, visitor control and quarantine of sick animals to prevent disease transmission. Before, farmers sometimes use lime powder for disinfection. Now they knew more kinds of disinfection chemicals and the frequency of application. Farmers also often used the same spraying bottle for both pesticide and disinfection. Through Animal Health flagship training, they understood that they should not do so.

"We come to know that we should not use the same bottle for pesticide and disinfection"



"Before my family have only one spraying bottle that I used for everything - pesticides, herbicides and disinfectants. Participating in Li-chan training, I was instructed to use separate bottles as pesticides and herbicides are poisonous and could be harmful. I knew how to use disinfectants to kill the parasite insects in cattle and pigs. I saw that if we sprayed disinfectants, less cattle and pigs got diseases. Before the project began, I sprayed disinfectants every three years. I only used lime powder, which was for the floor only. If we sprayed disinfection, we would be able to spay on the wall and the roof as well. In case there are no diseases outbreak, I spray disinfectants every three months."

Narrator and photographer: Leo Van Quan, male, Thai ethnic, 36 years old

Many livestock farmers improved their knowledge on farm management; however, not all of them can afford farm renovation cost.

"Not good for cow health but we can't afford roofed stable"



"Most Hmong people in Buôm Khoang village graze their cows. In the village, a few households have built cattle sheds, though with no foundations and no roof and a temporary trough for feeding. This negatively affects the health of the cows. Most households have not built sheds due to financial difficulties. They cannot afford the foundations and the roofs of the sheds. Next year, when the cows and sugarcane are sold, they will build the foundations of the sheds for the cows."

Narrator and photographer: Ly A Nu, Male, Hmong, 39 years old

Before the Covid-19 pandemic, farmers got vaccination for foot and mouth disease, Pasteurella for cattle and Pasteurella and classical swine fever for pigs twice a year, with support from the government. Farmers only have to pay for the needle. However, in 2020 and 2021 due to limited funds, there was only one round of vaccination per year in Son La. When the lumpy skin disease hit Son La, most farmers in Mai Son were willing to pay for vaccine. The disease was found in all villages in Chieng Chung and Chieng Luong, even in remote villages like Xam Ta and Buom Khoang, where farmers often graze their cows in pastures two or three km away and were only accessible by foot – which was a challenge for vaccination. Commune and village vets revealed that the knowledge from Li-chan's training on lumpy skins in September 2021 helped them to treat the infected cows more

effectively, though some reported that they also got knowledge from another veterinarian network in Mai Son district.

Adoption of biosecurity measures

Use of disinfection

"I am cleaning the pigsty. Firstly, I remove the faeces before washing the pigsty with water. Then, after leaving it to dry, I disinfect the pigsty with a disinfectant bottle given to me by the (Li-chăn) project. After using up this bottle, I will buy another one. I wash the pigsty every week and apply disinfectant spray once a month. I find that the pigsty is less prone to mosquitoes and bugs after spraying like this. I feel more secure after spraying."

Narrator: Thao Thi Ganh, female, Hmong, 27 years old
Photographer: Giang A Lu, male, Hmong, 9 years old





"On the day of this photo, the whole village of Buôm Khoang had their cows and buffaloes injected with the Pasteurella vaccine. The vaccine was provided by the government free of charge. People just needed to pay 2,000 dong (10 US cents) for each syringe.

Before the cows are pulled into the bamboo crush for vaccination, the crush needs to be sprayed with disinfectant. When the vaccination is completed for the cattle of one household, the crush is disinfected again to avoid cross infection among cows of different owners. Previously, I only knew about vaccinating and I did not spray disinfectant. Thanks to the Li-chăn project, I am now aware of disinfecting to prevent disease transmission. I hadn't known about the cattle crush until I took part in an artificial insemination training by the Li-chăn project. Without the crush, the cows run around, losing half a vaccine dose sometimes."

Narrator: Ly A Nu, male, Hmong, 39 years old
Photographer: Ly A Trong, male, Hmong, 43 years old

Keeping livestock diary, including recording people visiting farms, new animals, using of medicines, vaccines and selling and calculation of profit, was also mentioned to be adopted by more than 10 households that Animal Health flagship gave livestock diary to them.

Adoption of farm management

In general, farmers understood the importance of farm management, including food, water container, cleaning farm and composting. However, farm innovation often required a big investment, not all farmers could afford this. In 2020-2021, there were several farm innovations in each intervention villages, including building new stable, adding drink or food container.

Farm renovation



"This is a pig stable for Mr. Lo Van Quan. Previously, he had a wooden stable, but it was rotten and he built new concrete stable. He plans to buy a new mother sow and to keep about eight pigs at a time. He also will reserve a separate lot to quarantine the new animal. He got this knowledge from the village vet, and the village vet got it from Li-chan project."
Narrator and photographer: Luong Van Yeu, male, Thai, 47 years old

"I used to keep buffaloes under the floor of my pillar house without troughs; not even a water trough. This practice made my house constantly wet, affected the animals' health and allowed parasites to grow. It also affected our human health. Buffalo dung was collected and kept under the floor. Following guidance from the new rural development programme, I built a shed for my buffaloes at the end of 2019. As the village leader, I did it to set an example for other villagers to follow. We needed to remove the livestock and poultry and build separate sheds for them. The shed floors must be high, allowing the shed to cool in summer. I had to make a feeder, a water trough and a pipe to drain waste.



I also built a separate container to compost both buffalo manure and agricultural by-products. The composting helps the livestock sheds stay clean and hygienic and generates fertiliser for crops. I do not need chemical fertilisers for my garden."
Photographer and narrator: Leo Van Quang, male, Thai ethnic, 36 years old

Roles of local veterinary officers

There were 5 stories mentioning the roles of local veterinary officers in disease prevention and control at both commune and village levels. In each commune, there was one veterinary officer. They were not full-time staff. In all stories, they were described as having important roles in prevention, vaccination and control of livestock diseases, despite low remuneration. They did not have salaries and only got 50 USD as monthly travel allowance. According to the commune veterinarians, their tasks include vaccination, disinfection, recording of animal herdsand vaccination date, and disposing off dead animals.

Heavy workload of commune veterinary officers

"Ms. Thu is a veterinary worker in Chiềng Lương commune. She usually vaccinates pigs, buffaloes and cows in the villages. She also educates farmers about the prevention of different diseases such as lumpy skin disease, foot and mouth disease and African Swine Fever in pigs. Previously, when villages such as Mờn and Ý Lường in this commune had an African Swine Fever outbreak, she told people to dispose of the dead pigs instead of eating them. Farmers were advised to disinfect their farms frequently and not leave their animals to roam. There is no vaccine for African Swine Fever, so biosecurity is key in protecting pigs from the disease.

Veterinary workers work on a part-time basis, earning only one million dong (40 US dollars) a month, but the workload is huge. During an epidemic, we have to work long days without rest.



In the photo, Ms. Thu is wearing gloves. Protective equipment includes clothes, gloves, boots and face masks to protect users from infection. In the case of the slaughter of an animal, it is imperative to wear protective equipment to avoid spreading pathogens to the external environment. Used protective equipment must be burned after the animal's disposal.

Currently, people do not understand the consequences of diseases. Some people only get their animals vaccinated when they get sick. Travelling is difficult and there is no electricity and refrigerators to store vaccines in remote areas. The roads to some villages in Chieng Luong are very difficult to access, "as steep as the road to heaven". In addition, the cattle are let loose to roam by households. It is difficult to catch them for vaccination. In the uplands, we have to visit the fields to vaccinate the cattle of households while the farmers say, "There's nothing wrong with the cows. Will you pay for it if it dies because of vaccination?"

Photographer: Lo Thi Khuyen, female, Thai ethnic, 27 years old

Narrator: Lo Thi Khuyen and Luong Thi Thu, female, Thai ethnic

"Village veterinary officers are helpful"



"Before, there was no veterinary officer in Buôm Khoang village. I did not know where to ask for help when my cattle got sick. Since Mr. Nu has started working as a veterinary officer in the village, buffaloes, cows and pigs have been vaccinated. We hope he will have more training to improve his skills in treating the animals. After receiving training from the Li-chăn project, he has been able to advise people on animal husbandry and has explained to us about vaccinations and check-ups for animals when they are sick. Recently, there has been an outbreak of lumpy skin disease in Buôm Khoang village. Given that the cows are grazing far from village, Mr. Nu instructed villagers to bring medicine and syringes to the grazing area for injection."

Narrator and photographer: Ly A Trong, male, Hmong, 43 years old



"Mr. Thanh is Khoa village's veterinary officer. He is going to inject anti-parasite for pigs and cows. When lumpy skin diseases hit our village, there were 25 infected cows. Mr. Thanh successfully treated 23 cows except for those that were too small or the family informed him too late. He helps to prevent big economic loss for farmers."

Narrator and photographer: Leo Van Quan, male, Thai ethnic, 36 years old

Feeds and forages theme

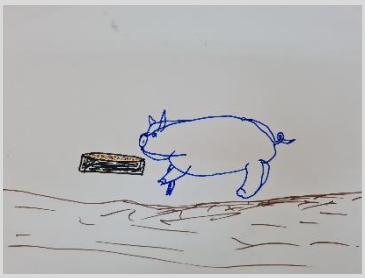
Feeds and forages was the theme that farmers took the most photographs about. It is understandable as during the photo-taking sessions, the Feeds and Forages flagship was establishing 155 farmer-led with improved forages. Moreover, feeding animals were what farmers did on daily basis. Among 68 stories on feed and forage theme, most of them were about improved forages.

- Improved forages (46)
- Making silage (5)
- Probiotic mix (2)
- Feeds and nutrition for pigs (3)
- Urea-treated straw (2)
- Grazing (10)

In the most significant change exercise described above, many farmers mentioned about improved foraged and nutrition for cattle and pigs as their most significant changes.

Improved nutritions for cattle and pigs





Dough works by Luong Thi Dung, female, Thai ethnic
Drawings by Ha Thi Son, female, Thai ethnic
“Before the training, I only made silage with sugarcane tops. But now I know that grass can be used to make silage as well. Previously, I did not add bran. I learnt from the training that adding bran helps mitigate against mold” (Luong Van Dung, male, Thai ethnic, 41 years old)

Improved forage



Drawing by Lo Thi Khuyen, female, Thai ethnic
“This is Guinea grass provided by the (Li-chăn) project for trial planting. In addition to rice bean, we grow three varieties of grass: Guinea, green elephant and Mulato II. We have harvested 17 kilograms of Guinea grass, 15 kilograms of Mulato II grass and 35 kilograms of green elephant grass on an area of four-square metres. Rice bean is planted to harvest its foliage for feeding the cows. The productivity is satisfactory. Currently, these varieties are suitable for the soil, but I don't know if they are drought tolerant during the dry season.” (Luong Van Dung, male, Thai ethnic, 41 years old)
“Our cows eat the grasses and forage plants such as green elephant grass, stylo, Guinea grass and banana leaves from the Li-chăn project trials. Before, they were fed with banana stems and VA06

grass only. Now the forage is more abundant and nutritious with added ingredients." (Leo Van Quan, male, Thai ethnic, 36 years old)

Knowledge change in improved forages

Among the intervention villages, farmers in Mon 1 and Mon 2 villages (Type A) often kept animals in confinement most of the time, sometimes they tied buffalos and cows near the spring, on the side road or in the rice field after harvesting. Farmers in Khoa and Oi villages (Type B) mixed between confining, tethering and grazing. The Hmong in Xam Ta and Buom Khoang (Type C) did not have stables for pigs, cattle, and buffalo, before the interventions. They often grazed cattle and buffalos in a pasture 2 – 3 km away and kept pigs in shacks, which were in the forest or near their upland rice or maize fields. The Hmong often live in higher altitude areas, where there is more space for grazing. Some Thai in lower villages also had shacks near Hmong villages. The elderly in the family often stay at the shacks and to take care of the animals.

In Chieng Chung, farmers reported to have feed shortage in winter due to lack of forage to collect in dry seasons. This was less a problem in Chieng Luong commune as there the sugarcane harvest season fell in the dry season (October – April). Therefore, farmers could feed cattle and buffalos with sugarcane tops. Regarding these issues, Li-chan interventions included testing cold and drought tolerant forage varieties and trained farmers on feed preservation so that they would have enough feed for their animals the whole year round. Previously, farmers in all villages except for in Xam Ta village planted forages, but mainly *Napier* and VA06 – a hybrid of *Napier* and *Pennisetum*. These varieties would not grow in the dry season.

Li-chan tested seven varieties including Green Napier, Mombasa Guinea, Ubon Paspalum, Mulato II, Stylo, rice bean and pinto peanut *(Arachis pintoi).* Farmers knew more kinds of grass and legume varieties. They could test the new varieties on their land and measure the productivity by themselves.

"My cows love it"



"By the beginning of August, the elephant grass is very tall, two months after planting. Two varieties of grass are grown on this farm: the pilot green elephant grass and the traditional elephant grass. They were planted on the same day, but the green elephant grass is much taller. The yield is 15 kilograms for each four square metres. Previously, I planted traditional Napier grass. The yield was good, but I don't know exactly how much it was because I didn't weigh it. Definitely the productivity was lower than that of the green Napier grass. This grass is soft. My cows love it, even the stems. The old Napier grass is not as beautiful as the grass the project gave us. The (Li-chăn) project's green Napier grass is less hairy, has wider leaves and appears to have a sweet taste."
Narrator: Ly A Trong, male, Hmong, 43 years old
Photographer: Bui Van Tung, male, Muong ethnic, 31 years old

In general, farmers preferred cut and carry grass to Ubon paspalum and legumes such as stylo because "they are tall and easy to harvest". Some farmers reported that their cattle and buffalos had diarrhea after being fed with Green Napier and some refused to eat Mulato II. Having this information from photovoice, Feeds and Forages flagship prepared a manual on how to feed cattle with the newly introduced varieties. Some farmers suggested that Green Napier contained more water, so they left

it to dry overnight. In the manual, Li-chan recommended that farmers should have harvest the grass when it was mature enough. If they harvested grass on rainy day, they should have leave it to dry or mix with rice straw. Farmers should also make their cattle get slowly acquainted to new grass or legume by mixing it with the feed that they were used to or letting them eat the new forage first before adding other kinds of forages.

"If our buffalos don't eat, we will not grow anymore"



"My buffalos don't like to eat Mulato II. They eat Guinea but not Mulato II. My husband said if buffalos don't eat then we will not grow anymore" (Quang Thi Soi, female, Thai ethnic, 28 years)

"Leading a farm-trial, I see that Guinea grows fast, have high volume. My cows love to eat Guinea. I also plant Mulato II and Ubon Paspalum. Cows like to eat Ubon Paspalum, but they only eat a few Mulato II leaves and leave all the stem. Maybe they haven't gotten used to it" (Lo Thi Khuyen, female, Thai ethnic, 27 years old)

"This is a Mulato II garden of Ly A Cho. After two months, he could harvest 13 kg in a four-square plot. It is suitable for the soil here. The productivity is high. When Mr. Cho fed the cows, they only eat a few leaves and did not touch the hard stem."

Narrator and photographer: Ly A Trong, male, Hmong, 43 years old

Through photovoice stories and discussions, farmers expressed that they preferred Green Napier the most because of its softness and high biomass. However, the photovoice interviews and discussion were taken during rainy season when Green Napier grew well. In dry season, farmers also saw the drought-tolerant benefit of Mombasa Guinea and Mulato II.

Through photovoice interviews and discussion, farmers mentioned benefits of cultivated forage:

- Secure animal feed, especially in winter
- Less time consuming than grazing or collecting forages
- Preventing erosion (discussed further in 6.4. Livestock and Environment theme)
- Reduce weeds
- Protect crops from free-ranging animals
- Allow to confine animals and reduce animal death and injuries due to accidents or theft
- Allow to confine animals and make compost from animal manure

"It takes all day long to graze cattle"



"I herd the cattle in *son tra (Docynia indica)* forest. When the *son tra* trees are small, we do not herd cattle there because they can eat the leaves. When the trees are three years old, then we can graze cattle so that they eat the grass underneath the *son tra*. Every morning, at 9–10 a.m. I go herding. I take some rice and a bottle of water. At about 4.30 pm, I gather the cattle to take them home. Some of them will go further than the others in the forest to find more grass. It takes all day long to graze cattle."

Narrator and photographer: Song A Hia, male, Hmong, 27 years old

“Collecting grass is the most time-consuming”



“Ms. Ha Thi Tiet (64 years old) has just gotten back from collecting grass for buffalo and cattle. The forest is 3 km away. It takes about two hours to collect grass in the forest. Ms. Tiet and her daughter in law take turn to collect grass. It is the most time-consuming tasks in keeping livestock. Grass is only available in the rainy season”. (Lo Thi Khuyen, female, Thai ethnic, 27 years old)

“Since we started growing grass, we have saved more time and energy. If we cut grass in the forest, we have to look for grass from different places. It takes the whole morning or afternoon to collect only 50 kg. It is not enough for the cattle and buffalo to eat so we have to graze them for half a day as well. Altogether, we spend all day feeding the buffaloes and cattle.” (Ly A Trong, male, Hmong, 43 years old)

Benefits of cultivated forage



“My wife is going to cut grass in our field, about 100 m from home. It often takes her about 30 mins” (Luong Van Dung, male, Thai ethnic, 41 years old)

“Now, few people graze their cattle in the fields. They mainly confine their animals. Confinement is better than herding because it only requires grass cutting. Herding is more time consuming. It is easy to tell the animals raised by herding from the confined ones because they are skinny.” (Luong Thi Dung, female, Thai ethnic, 24 years old)

“Confining animals is less hard for farmers. It requires one person’s labour to herd animals in the fields, while one working hour is needed to cut grass for confined animals. Leaving for grass cutting as early as 5 a.m. or 6 a.m., farmers can then go home to do other things afterwards.” (Luong Thi Than, female, Thai ethnic, 26 years old)



“My wife is weeding the newly planted Mulato II grass which was intercropped in the plum field. When the photo was taken, the grass had been planted only 10 days before. Some people kill grass, but we grow grass. The distance between plum trees is six metres, giving space to grow grass. I plant grass to feed our cattle while creating shade, keeping moisture in the soil and preventing erosion. In this field, I planted plums with soya beans. This is the first time I have intercropped soya beans with plums. I don’t have to do weeding in the plum field and at the same time I can harvest soya beans. Currently, I have three cows and one buffalo. I have enough grass because I have sugarcane leaves in the dry season. However, there will be shortage of fodder if I expand the herd.” (Ly A Trong, male, Hmong, 43 years old)

Picture 1: Luong Van Dung, male, Thai ethnic, 41 years old

Picture 2: Ly A Trong, male, Hmong, 43 years old

Knowledge change in animal nutrition

Farmers mentioned the benefits of more nutritious feed proportions for animals. In the dry season in Chieng Chung, or after sugarcane harvesting season in Chieng Luong (in April – May), farmers used to feed cattle and buffalo with rice straw or dried grass. In Mon villages, where they made silage to preserve the nutrition in grass and sugarcane tops, farmers also learned to add more rice bran and keep the bag air tight.

"Before Li-chan, we often let the buffalo eat grass on the roadside, in the forest or rice straw. They don't eat enough so they are thin. Now we know how to make silage, to make use of the crop residues and preserving the nutrition for cattle all year round" (Luong Van Dung, male, Thai ethnic, 41 years old).

"I now know how to protect silage from mold"



"Lò Văn Thương has five buffaloes. When fresh sugarcane tops are not available, he uses fermented tops to feed his cattle. Since 2016 and 2017, farmers in Mờn village have been fermenting grass and sugarcane tops to make fodder. Following these pioneers, I also ferment grass for the dry season, when there is a shortage of fodder. Previously, I did not add anything except sugarcane tops. Learning from the training by the Li-chăn project, I know that mixing rice bran helps fermentation, and sealing the bags protects the air-free silage from mold or rotting. My cattle prefer fermented grass."
Narrator and photographer: Luong Van Yeu, male, Thai ethnic, 46 years old

Regarding nutrition for *Bản* pigs – which often have high proportion of fat (sometime up to 70% according to farmers), Li-chan also provided trainings on balanced nutrition for pigs. Farmers often fed pigs with high carbohydrate feed such as rice bran, maize and dried tapioca, taro or sweet potato, not enough water and keeping the pigs for too long, increasing the fat content.

"Pigs raised to the age of 10–12 months get the best price. Beyond this age, they get fat and can only be sold at a lower price." (Luong Van Yeu, male, Thai ethnic, 46 years old)

"Soya bean waste from making tofu can be fed to pigs, it will have more lean meat. Farmers should add legumes in animal feed because it is protein rich" (Leo Thi Xien, female, Thai ethnic, 31 years old)

In many photovoice interviews and discussions, farmers also mentioned the nutritional benefits of legume (soya bean, rice bean*, Stylo* and *Arachis pintoi*).

"Legumes make the soil porous and rich in nutrients, while their stems are protein-rich fodder for livestock and poultry." (Luong Van Yeu, male, Thai ethnic, 46 years old)

"I have grown pinto peanut[6] plants to feed my goats because they contain more nutrition. I wanted to plant a lot but I had only one bag of seeds. Now I want to plant peanuts on a very large piece of land

[6] **Arachis pintoi*

to feed my goats. When I have a lot, I will share the seeds with my sisters to plant together in order to expand the vegetation to prevent soil erosion and give me fodder for my goats." (Thao Thi Ganh, female, Hmong, 27 years old).

Adoption of improved forage

Most farmers said they would continue to plant forages after the trials, having seen which varieties were suitable for them. Some farmers also shared the stem and seedlings to other farmers to replicate the varieties.

"Next year I will expand the Guinea and Paspalum planted area" (Lo Thi Khuyen, female, Thai ethnic, 27 years old)

"Even Guinea is not as productive as Green Napier, many households will continue to grow them so that they will have feed for cattle in the winter" (Ly A Trong, male, Hmong, 43 years old)

"Once we know from the trials which are the good varieties, we will replicate them and ask other households to plant them. I myself will grow more Green Napier and Guinea because they are tall and easy to harvest." (Luong Van Dung, male, Thai ethnic, 41 years old)

"I wanted to replicate this variety for other households in the village"



"Green elephant grass has been picked and used as seedlings. I could have cut it before, but I wanted to replicate this variety for other households in the village. That's why I left the grass to mature more. The tops are fed to my cattle, while the stems are being given to my neighbours for replanting. Cattle like to eat this grass most of all and its yield is also high. The grass looks like sugarcane, and it is grown like sugarcane too."
Narrator and photographer: Ly A Trong, male, Hmong, 43 years old

Adoption of animal nutrition

Feed mix and urea-treated straw were technologies that Li-chan project introduced to farmers.

Adoption of urea-treated straw

This is the straw I treated with urea to feed my cows. Before joining Li-chăn project's training, I did not know about mixing straw with urea and used only straw. Being fed with straw treated with urea, the cows look beautiful and their coats are soft. They consume more straw than before because the straw is softer.
Narrator: Quang Thi Thuan, female, Thai ethnic, 31 years old
Photographer: Quang Thi Nuong, female, Thai ethnic, 12 years old



Adoption of feed mix for pigs



"Before we cooked collected forage with rice bran. Now that we know we can mix forage with rice bran and probiotics, we find it less hard. The pigs also eat more and grow faster"
Narrator: Lo Thi Khuyen, female, Thai ethnic, 27 years old
Photographer: Leo Van Quan, male, Thai ethnic, 36 years old



"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: Quang Thi Thuan, female, Thai ethnic, 31 years old
Photographer: Quang Thi Nuong, female, Thai ethnic, 12 years old

Livestock and Environment theme

Environment-related stories cover the following topics

- Intercropping with legumes (8)
- Erosion control (6)
- Biomass recycling (2)
- Using manure, composting (2)

Changes in awareness on erosion

The word "erosion" was mentioned 21 times in all photo stories. Farmers mentioned erosion control measures such as cover crop, intercropping and grass contour, and use of manure (composting). Because of mono-cropping (cassava, maize and sugarcane), deforestation and the steep typology, land in Son La province in general has been facing severe erosion. Farmers themselves also realized soil degradation due to erosion in many photovoice stories. Farmers were also aware of erosion control measures. They mentioned planting trees, intercropping coffee, plum with *Arachis pintoi,* grass contour and using manure and composting. They said planting forages meant *"killing two birds with one stone"* in the senses that they would have animal feed while protecting the soil from erosion.

Awarness of erosion and erosion control measures



"I took the photo at Mường stream. Currently, people cultivate corn, sugarcane and cassava. I'm afraid that nothing will be able to be planted in a few years due to soil erosion. It is important to make contours to retain the land." (Luong Thi Than, female, Thai ethnic, 26 years old).

"Previously I planted corn on this land, but the soil had deteriorated through erosion. The following sugarcane cultivation failed, and now I am planting rice bean to improve the soil quality." (Quang Thi Thuan, female, Thai ethnic, 31 years old).

"I planted maize on this plot about 7–8 years ago. When the soil was degrading, corn could not grow. I planted Chittagong wood. Two years after planting Chittagong wood, I planted corn, but again it could not grow" (Cam Thi No, female, Thai ethnic).

"The productivity of this coffee orchard is poor. The trees are stunted and not fruitful. The tree branches are dry or dead. It is advisable to intercrop pinto peanut on sloping and barren land to both expand the vegetation coverage and improve the soil." (Leo Thi Xien, female, Thai ethnic, 31 years old)



"This is Ha Thi Chom's upland field. She planted coffee on this field but it could not grow. She planted annual crops such as maize and cassava but the productivity was low, too." (Leo Van Quan, male, Thai ethnic, 36 years old).

"In Xam Ta, the land is vertically steep, it must be about 60 degrees. There are stones in the soil. I planted this grass contour and pinto peanut to make cover and prevent erosion, but the soil is too bad that even grass could not grow." (Song A Trang, male, Hmong, 23 years old).

Picture 1: Luong Thi Than, female, Thai ethnic, 26 years old
Picture 2: Song A Mua, male, Hmong, 24 years old

Changes in awareness on biomass recycling

Don't burn rice straw



"The rainy season comes after harvesting the rice in June. Villagers are afraid that they won't be able to collect the straw in time, therefore they burn it to make that land available for a new crop. But burning is harmful because the smoke pollutes the air. When straw is burnt, thick smoke blankets the hills and mountains. In the morning and evening, fog prevents the smoke from escaping to the sky, making it hard to breath. If time is available, farmers should bring the straw home to feed their cattle, to make compost as an organic fertiliser, and grow delicious mushrooms."

Narrator and photographer: Lèo Thị Xiền, female, Thai ethnic 31 years old

Adoption of erosion control measures



Grass contour

The picture shows grass intercropped with Chittagong wood on a farm owned by Ms. Cầm Thị Nò. She plants Ubon paspalum, Mulato II and pinto peanut at the foot of the hill and stylo on the top. Corn was common on this farm about 7–8 years ago. When the soil was degrading, corn could not grow. Chittagong wood was selected to cover the bare land. Two years after planting Chittagong wood, Ms. Cầm Thị Nò planted corn, but again it could not grow. With grass seeds provided by the (Li-chăn) project, she tried planting grass to prevent erosion, improve the soil, and have more grass for her cows. She collected 11 kilograms of grass from an area of four square metres.

Photographer: Luong Van Dung, male, Thai ethnic, 41 years old

Intercropping with legume

"In this field, I planted plums with soya beans. This is the first time I have intercropped soya beans with plums. I don't have to do weeding in the plum field and at the same time I can harvest soya beans. Up the hill, I am intercropping plums with Mulato and pinto to cover the soil and prevent erosion."

Narrator and photographer: Ly A Trong, male, Hmong, 43 years old



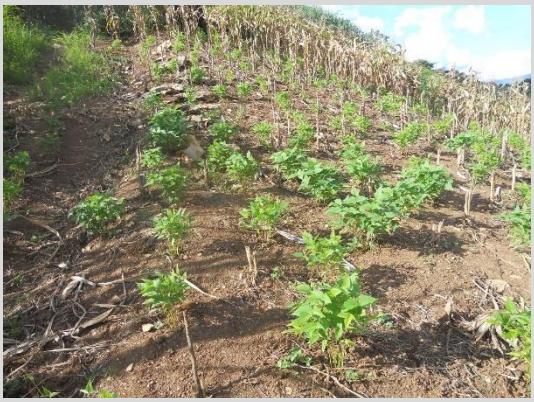


"We grow pinto peanut in the coffee orchard. Pinto peanutss are helpful for soil improvement on sloping terrains, making the soil more porous and richer in nutrients. The productivity of this coffee orchard is poor. The trees are stunted and not fruitful. The tree branches are dry or dead. It is advisable to intercrop pinto peanuts on sloping and barren land to both expand the vegetation coverage and improve the soil."

Narrator and photographer: Leo Thi Xien, female, Thai ethnic, 31 years old

Rotation

"Mr. Ly A Cho rotates between maize and rice bean to have cover crop for the soil. He could have left the maize dry in the field and the rice bean will grow on the dried maize"
Narrator and photographer: Thao Thi Ganh, female, Hmong, 27 years old



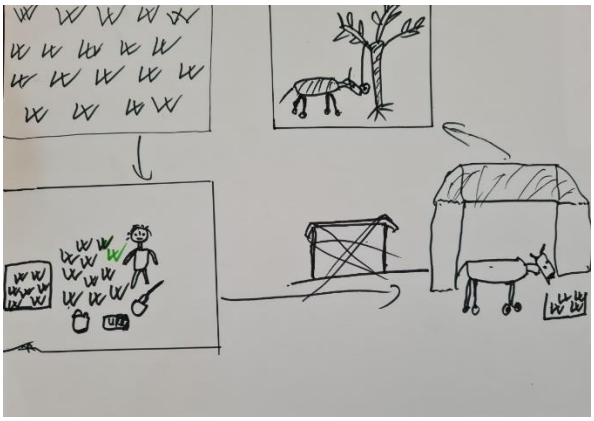
Manuring

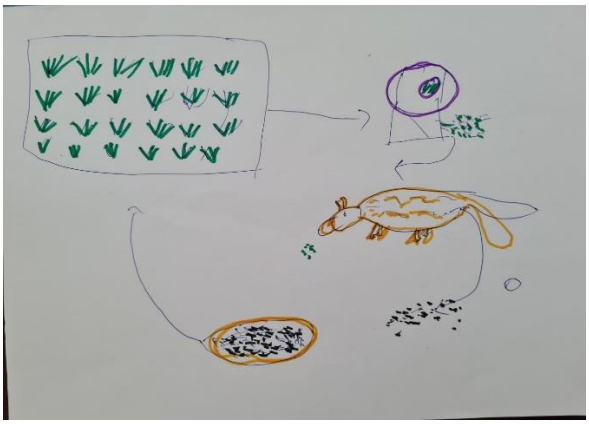


"I use manure for plum trees to increase soil fertility and make soil softer. I did not have time to make compost yet, because I will need rice straw to make compost and then have to wait for a few months before I can use."
Narrator and photographer: Ly A Trong, male, Hmong, 43 years old

Adoption of biomass recycling

In the most significant change exercise, there were three groups who mentioned about biomass recycling.





"We should plant forages and use crop residues to feed animals, then use their manure for forages and crops, then feed the animal with forages. It is a cycle" (Song A Trang, male, Hmong, 23 years old)

It was common practice for farmers in Chieng Chung and Chieng Luong communes to use crop residues (e.g. rice straw, taro, sweet potato, pumpkin and soya bean, mung bean leaves and sugarcane top) to feed animals. In type C villages (Buom Khoang and Xam Ta) where grazing was still common, farmers

could not collect a lot of animal dung to apply to crops or make compost. In type A and B villages, farmers who confined animals collected animal manure, but they mainly put it in a pile without making compost. In Chieng Chung where most farmers grew coffee, they had abundant coffee peel to add to the compost.

Composting



"After the training, we added rice straw, crop residues, it became drier, softer and porous. The composting helps the livestock sheds stay clean and hygienic and generates fertiliser for crops. I do not need chemical fertilisers for my garden."
Narrator and photographer: Leo Van Quan, male, Thai ethnic, 36 years old



"I am shoveling compost from manure into bags to apply to mango and longan trees in the fields. Before the Li-chăn project's training in March 2021, we had never composted. After the training, we started to collect the manure of our buffaloes and cows for composting. I take advantage of the available manure and by-products to save on fertiliser expenses. The compost is porous. Chemical fertilisers are absorbed into the ground and evaporate into the air, leaving the soil dry. And chemical fertilisers are very expensive. Before, nitrogen fertiliser was 80,000 dong (3.5 US dollars) for 10 kg. The price has now increased to 120,000 dong (5 US dollars)."
Narrator: Luong Thi Dung, female, Thai ethnic, 24 years old
Photographer: Quang Van Quyen, male, Thai ethnic, 27 years old

Livelihoods and Agri-food Systems theme

Smallholder Thai and Hmong farmers have traditionally diversified farming and livestock keeping activities for self-sufficient income. Nowadays, these practices can still be found in the Thai and Hmong communities in Chieng Chung and Chieng Luong communes. Most households still did not have to buy rice except for Hmong households in Chieng Luong. In the past, the Hmong practised slash and burn, which meant they burnt a plot of forest and cultivated for several years, then burnt new piece of forest glade, after 7-10 years they will return to the former field. However, this practice was only possible with low population and abundant forest. Since the Government restricted slash and burn practice, the Hmong in Chieng Chung changed to irrigated rice. The Hmong in Buom Khoang could not do irrigated rice due to steep and fragmented land, they had to buy rice. In Chieng Chung, coffee is the dominant perennial crop, while in Chieng Luong, most farmers grow sugarcane as a cash crop. Common fruit trees include plum, longan and mango. In Xam Ta, which is over 1000 m above sea level, people grow *son tra* (*Docynia indica*) after a forestation project supporting the villagers with the seedlings in 2019.

Regarding livestock keeping, most households have more than one species. Most households have poultry and pigs for household consumption. Buffalos are used for both draught power and meat. One average household can have about 5-7 pigs and 1-3 cattle or buffalos. Households who have more than 10 pigs or 6 cattle are considered "large-scale farmers" in the village. In Xam Ta, farmers also have the tradition of *"nuôi rẽ"* (keeping together). More well-off people in lowland areas of Mai Son

district gave cattle to Hmong households in Xam Ta to take care of. If the cattle gave birth, the odd number belong to the owners and the even number will be given to the households who take care of the cattle. Some households might take care of more than ten cattle, but only half of the herd actually belong to them.

Thai and Hmong people also use buffalo or cattle meat in weddings, funerals, holidays and New Year's days and festivals such as kinship festival, rice harvest festival, baby shower or for good health worshipping. A chicken is usually needed for the ceremony. Depending on the number of participants, they would slaughter chicken, pigs, buffalos or cattle.

Livestock in Hmong traditional ceremonies





"At the time of this photo, my grandmother was sick. A witch doctor was invited to make an offering for her and the family to be safe and healthy. In the photo, the witch doctor is praying.

My grandmother was sick because the dead people were starving and sending their souls to come back and claim her. Therefore, a pig was sacrificed to make them full and stop asking. Two or three days after the offering, she really got better.

The pork was shared by the whole family. The witch doctor was given a head and a leg to worship with at his house. After he returned home, the host family had to stay in the house for a day without going out, and other people were not allowed in. During the meal, the children shared food on a separate tray and the daughters-in-law had a meal on a separate tray as well. The daughters, uncles and aunts shared the same tray as the witch doctor."

Narrator: Song A Chu, male, Hmong, 25 years old

Photographer: Song A Hia, male, Hmong, 27 years old



"A pig was slaughtered for a worshiping ceremony by the Lý family in the village. The ceremony is organised once a year on the 17th day of the seventh lunar month. This ceremony aims to pray for peace, to wish safe travel for people and to chase away harmful ghosts. The Lý family in the village has 18 households. They all attended the ceremony regardless of their age. A 58-kg pig raised by a household of the Lý family was slaughtered for this worshiping ceremony. The households take turns in hosting the ceremony, so they go to different households in different years. Each household makes a small contribution to purchase a pig, while the rest of the expenses are covered by the host family. In this ceremony, a pig is usually slaughtered, not a buffalo or a cow, because the small number of existing households does not require much meat. In addition, a chicken is needed for the ceremony."

Narrator and photographer: Ly A Trong, male, Hmong, 43 years old

Role of livestock in local livelihoods

Apart from using livestock for domestic consumption, livestock, especially large ruminants, is a source of household income. During the Covid-19 pandemic, when mobility and export were restricted, farmers considered livestock as a type of saving.

"But the fruit cannot wait"



"The daughter of Mr. Cầm Văn Thiêm in Mờn 1 village is feeding cows with elephant grass that they planted. Currently, crop production is not profitable. Therefore, they have to plant grass to feed their livestock, thereby increasing the family's income and making a better life for the children. Mango prices dropped from 15,000 dong (70 US cents) per kilogram before Covid to 2,000–2,500 dong (10 US cents) per kilogram at present. Beef and buffalo meat also decreased in price due to Covid, but the drop in price has been less. Before, beef was sold at 250,000 dong (11 US dollars) per kilogram live weight. Due to impact of Covid, the price has dropped by 20,000 dong to 230,000 dong (10 US dollars) per kilogram. But it will increase after dropping for some time. Farmers may be able to wait for a higher price before selling, but the fruit cannot wait. It will rot and fall down."
Narrator and photographer: Luong Van Yeu, male, Thai ethnic, 46 years old

Up to the end of 2021, *Bản* pigs and poultry were mainly used for domestic consumption. However, Li-chan interventions to develop more market-oriented pigs and beef value chains were still relevant as most farmers expressed that they wanted to sell livestock for cash income, but their productivity was still low. With the integrated interventions from Genetics, Animal Health and Feeds and Forages flagships, farmers were expected to improve both product productivity and quality (i.e. less fat) to better meet the market demands.

Accessibility

Accessibility is a big challenge for the livelihoods of farmers in type C villages (Xam Ta and Buom Khoang). The road conditions affect both their livestock production and sale. The roads are soft-surfaced and steep. In the rainy season, sometimes the only way to reach to the village is on foot. They have difficulties transporting materials to renovate their farms. To sell livestock, these farmers have less bargaining power. They have to walk with the cattle to the vehicle-accessible roads or accept the cut of 200,000-300,000 (8-13 USD) per head on the purchase price.

"This is the only access road"



"This is a road in Buôm Khoang village, where cars cannot pass during the rainy season. It is also a challenge for motorbike riders. People can travel from Buôm Khoang village to Chiềng Lương commune People's Committee on sunny days. On rainy days, it is muddy and slippery, causing dirt to stick to wheels. In the rainy season, it takes one hour to ride a motorbike along this seven-kilometre road. This is the only access road. Villagers have to take this road whether they are going to school, to work or to market. If they want to sell a buffalo or a cow, they have to walk for half a day. No truck will come to collect the cattle. Buyers also require farmers to take the cattle to the asphalt road before they buy. Otherwise, they will ask someone else to bring the cattle to them at 200,000–300,000 dong (8–13 US dollars) per head and cut that from the purchase price. It is also difficult to transport materials for building sheds. Transport expenses are as high as the material costs. Therefore, building sheds is difficult for the villagers."
Narrator and photographer: Ly A Trong, male, Hmong, 43 years old

Labour division

Traditionally, Thai and Hmong households in Son La often have a shack in the upland fields where they kept the animals and worked on the nearby fields. Currently, this practice is common among Hmong and to a lesser extent, among the Thai ethnic farmers. Those who usually take care of the animals in the shacks were the elder people in the family.

This is our shack







"This is our shack in the upland field. The plum and longan plantations are nearby. Our buffalos, cattle and poultry are all kept there. Usually, my parents stay in this shack and feed the animals. When they are home then my wife and me take turn to stay in the shack" (Ly A Trong, male, Hmong, 43 years old)

"Our shack is in the middle of the forest. It is cold and misty there. My dad goes to feed the pigs at about 5 pm then he sleeps over in the shack and feed them another time in early morning. Then he goes back home during the day. The pigs can go and find food in the forest nearby" (Song A Mua, male, Hmong, 24 years old)

"Thai ethnic people often have this kind of shacks in the upland fields. While they work in the field, they can also tie the buffalos and cattle there so they can eat the grass nearby. This shack was built 15 years ago. When there was no motorbike, we often walked and stayed in the shack overnight" (Luong Thi Thu, female, Thai ethnic, 37 years old)

Skimming through all the photographs, we could see that there were many images of women, especially photos related to animal feed. Women were the ones to prepare food for the family and feed for animals. This includes also heavy chores such as collecting forage, which was mainly done by women and children. Men usually did the tasks that required driving motorbike. Most Hmong women could not drive especially on soft-surfaced road in rainy season. Men also took care of disease treatment more than women because it often required driving motorbike for 10-20 km to buy medicine. Compared to pigs and poultry, men engaged more in large ruminants like buffalos and cattle as those big animals required masculine strength to handle. There were more than ten photo stories related to children herding cattle and buffalos. In summertime or after school, children usually graze buffalos and cattle in the harvested fields, on the hills or in the forest.

"Men are hardly involved in it"





"The grass field is about one kilometre from the house. The road is very steep, so the field is inaccessible by motorbikes. Grass must be carried home on the farmer's back. This load of Lý Thị Hồ weighs about 30 kilograms and the one of Hàng Thị Nanh is 50 kilograms. The grass cutting is mostly done by women and children, while men are hardly involved in it."
Narrator and photographer: Ly A Trong, male, Hmong, 43 years old

Adoption of CIGs

With the above-mentioned current situation of livestock value chain development, Li-chan promoted establishment of Common Interest Groups (CIGs) as a platform for farmers to share knowledge and information, organize collective purchases and sales in larger volumes, develop marketing networks and access to credit. Through photovoice discussions, farmers mentioned all the benefits of CIGs except for credit access. In reality, among five CIGs: one in Mon village (type A) and one in Khoa village (type B) could get access to credit. The former used rotating micro-credit to give loan to two households and the latter got loan from the Bank of Social Policy.

“People are excited about common interest group”

“This photo shows people taking advantage of the lunch break during a meeting of the livestock common interest group. After being trained, I realised the benefits of a common interest group in which members share inputs, outputs and linkages with traders as well as the application of biosecurity measures in livestock production. So, I discussed these benefits with other villagers. Referring to the livestock common interest group, people are very excited. At the end of this year, a group will be established. In the village, 11 households are willing to participate, and two households are still considering it. Currently, we are considering two options: pig and cow fattening. Maybe we will apply the cow fattening model first.”

Narrator: Ha Van Kim, male, Thai ethnic, 31 years old

Photographer: Lo Van Cuoi, male, Thai ethnic, 41 years old



Conclusions

After one year of implementation of interventions, Li-chan met its short-term and medium-term outcomes. Long-term outcomes (i.e. increased productivity and income) needed more time to achieve. Hundreds of stories of change proved that farmers and veterinarians improved their knowledge on animal husbandry, including breeding, artificial insemination, biosecurity, farm management, improved forages, animal nutrition, feed preservation, erosion control, biomass recycling and benefits of collective action. All of the livestock-led innovations were adopted by farmers in the intervention villages.

Genetics flagship: There was evidence that farmers changed their knowledge and attitude about improved breeds and artificial insemination (AI). The AI pilot cleared many worries of farmers on crossbred *Bản* pigs and local cattle. AI on pigs was adopted by more households. AI on cattle remained challenging due to lack of access to equipment.

Animal Health flagship: It was relevant to build capacity for local veterinarians as they played important roles in disease management and control in the grassroots. Disinfection was the most widely adopted biosecurity measure. Among introduced farm management interventions, using mineral stone for cattle was appreciated by farmers. Other interventions such as control of visitors and keeping livestock diaries were limited to demonstration households. However, if it had not been for the Covid-19 pandemic, the flagship would have organized cross-learning visits to demonstration farm to introduce the measures to more households.

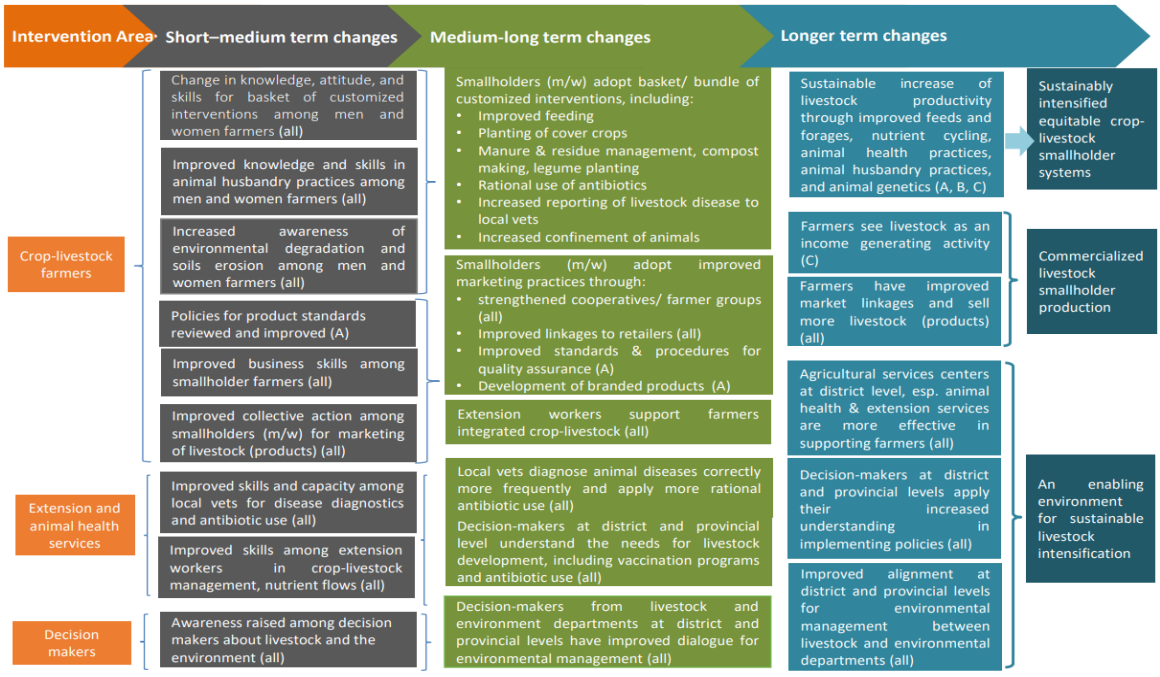
Feeds and Forages flagship: Farmers increased their knowledge on improved forages, animal nutrition and feed preservation. Many adopted improved forage varieties and would replicate in their communities. Feed-probiotics mix, making silage and urea-treated straw were also adopted.

Environment flagship: Farmers improved their awareness on erosion and control measures. Some measures such as intercropping, rotating, using grass contour and manure, making composting were adopted among farmers.

Livestock Livelihoods and Agri-Food System flagship successfully established five common interest groups in the intervention areas. These groups would be the platform to share and scale out technical innovations of other flagships. It was expected that farmers could get better access to market and stronger bargaining power through CIGs.

The limitation of this photovoice project was that it was conducted in a short time (about two months) while it would require a longer time to evaluate farmers' preference of improved forages, for example. In a short period, photovoice provided not only huge materials to analyze for Li-chan project's success but also helped to give a voice to the ethnic minority farmers and reached out to researchers and policy makers.

Annex 1: Li-chăn's Theory of Change



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