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Photo: Tu Mai

CGIAR Research Program on Livestock Participatory epidemiology and gender analysis to address livestock disease constraints in Son La Province, Vietnam

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Alliance



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1. Introduction

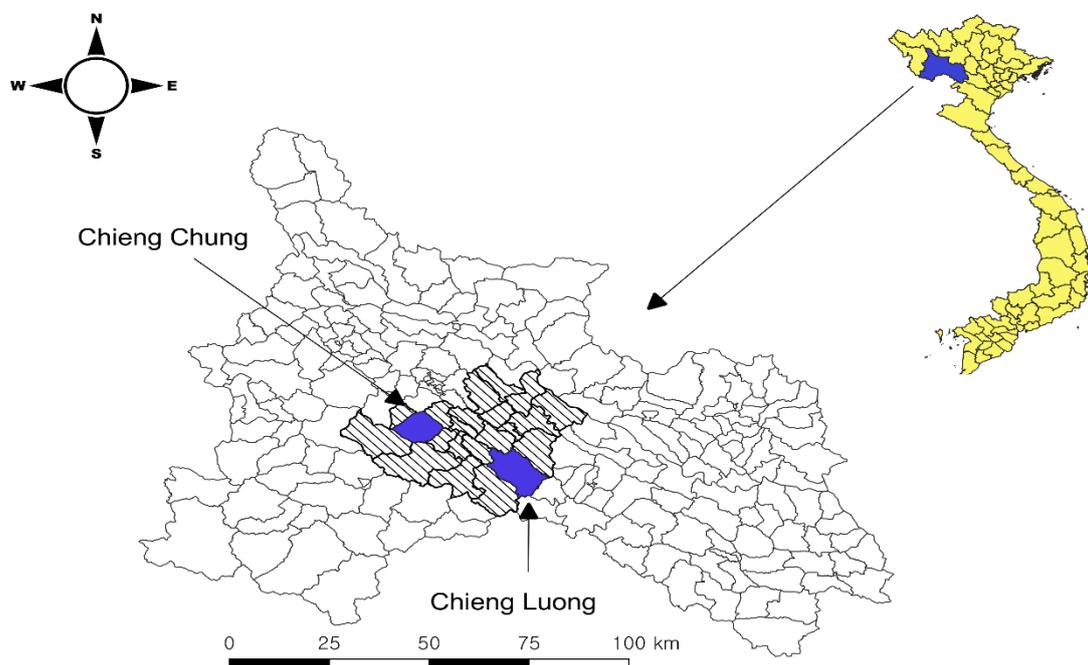
A participatory epidemiology (PE) and gender survey was conducted in Vietnam to better understand what the main livestock disease constraints are, how they affect different members of households, and how much men and women farmers know about livestock disease transmission. The study will assist in defining future research areas related to livestock diseases, their economic impacts and gender issues. Moreover, it helps to establish a baseline to monitor impact of future interventions in livestock health.

2. Materials and methods

2.1. Study areas

This study was done in two communes (Chieng Chung and Chieng Luong) in Son La Province, Vietnam, under the CGIAR Research Program on Livestock Animal Health Flagship (Figure 1). In Chieng Luong, participants were selected from midland and lowland areas while participants were not distinguished in Chieng Chung.

Figure 1. Study sites of the participatory epidemiology and gender analysis in Maison District, Son La Province.



2.2. Methodology

A series of preparatory activities were conducted before the fieldwork. Veterinarians and researchers from the National Institute of Veterinary Research (NIVR) were introduced to participatory epidemiology and the concept of gender analysis in a training workshop. They learned about participatory epidemiology tools and contributed to the development of the study protocol and plan for the fieldwork.

Two research teams (each team consisting of two researchers) conducted the survey with support from sub-department of Animal Health (sub-DAH) in two communes of Mai Son District in Son La Province from 22 to 27 October 2020. Each team consisted of one facilitator and note taker. A preliminary meeting was held with sub-DAH officials and site coordinators to introduce and explain the objectives of the study emphasizing the relevance of disease constraints in livestock and their impact on household members. As part of the preparation, suitable locations were provided by the sub-DAH for the focus group

discussions (FGDs). In each site, separate FGDs were conducted for men (> 35 years old), women (> 35 years old), male youth and female youth.

The FGDs for men and women were conducted simultaneously and findings from each group were presented briefly in a joint session at the end of the FGDs (Figure 2). Similarly, the FGD for the youth males and females were held in parallel and their findings shared at the end during feedback sessions. After the FGDs, key informants (local vets/ animal health workers) were interviewed for triangulation purposes and to collect additional information or to clarify issues that emerged during the FGDs.

In the FGDs various participatory tools were used, including proportional piling and seasonal calendar. First of all, participants discussed the importance of different livestock species and allocated 100 counters across the species mentioned to indicate their relative importance. Reasons for scoring the different species were recorded. In the second part, the participants listed five important clinical signs for the top two important livestock diseases (identified in the first discussion) that affect their herds. Then, we distributed 100 counters to indicate the relative importance of these diseases. They were asked to explain the reason for putting the scores to assess the importance of each disease.

The third part of the FGDs looked at the impact of these diseases on different household members. After listing the impacts of the diseases, the participants were asked to distribute 20 counters according to how household members (men, women, young men, young women and children) are affected and describe the reason for allocating the counters for the specific household members. They were also asked to indicate the coping strategies for the five major livestock disease encountered.

The fourth part of the FGDs was to evaluate the farmers' knowledge on disease transmission pathways. Participants were asked to explain and list up to five possible disease transmission pathways for the top two diseases. Proportional piling was done by using 20 counters per transmission pathway/situation to find out who (men, women, young men, young women, children) is mainly involved in specific transmission situations. The last discussion was to better understand how farmers use antibiotics and vaccines and where they buy or get information for their use. In addition, 100 counters were distributed to participants who used them to indicate the commonly used drugs and vaccines.

Figure 2. Pictures of focus group discussions held in Mai Son, Son La.



3. Results

3.1. Important species and their roles for livelihood

A total of 12 informant groups were interviewed (Chieng Luong: 8 groups and Chieng Chung: 4 groups). Overall, cattle (buffalo and beef) are the most common and economically important livestock species for farmers' livelihoods (Table 1). There were minimal variations in the perceptions of farmers regarding the important livestock species between the two communes, midland/lowlands, and age and gender. The major reasons farmers selected cattle as the most important livestock were: bringing large incomes from selling live animals and meat, saving instrument for farmers, manure for fuel and fertilizer, easy to manage (especially by older people and children), resistant to diseases, traction for crop production and milk supply. The second most commonly raised animals were chickens and other poultry. The main reasons were: no effort to take care of them, easy to sell, self-consumption and very cheap costs for raising them compared to other livestock (such as in feeding and medication). However, two groups (men and women) from the midlands in Chieng Luong commune selected pigs as the second most important livestock. We also discussed further with local authorities (local vet and sub-DAH officials from the communes) about the situation of raising pigs. Overall, pig raising households have been sharply decreasing because of the spread of African swine fever (ASF). The livelihoods of some households was seriously affected by ASF, and others had already sold or consumed their pigs to avoid losses caused by ASF outbreaks. However, we found that pig production is the third most important livelihood role for some farmers.

Table 1. Score for importance of livestock species [G1-4 (M) and G4-8 (L) in Chieng Luong; G9-12 in Chieng Chung]

Species	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	Average
Cattle	34	49	64	68	53	55	44	46	49.60	53.53	45.73	62.96	52.09
Pig	45	23	10	6	10	13	32	23	16.21	23.76	20.94	9.21	19.43
Chicken	10	21	21	21	30	27	11	19	26.97	20.21	23.94	16.21	20.58

Muscovy duck, duck	4	8	2	5	2	3	11	8	4.91	2.01	5.50	4.63	4.96
Goat	7	-	2	-	5	2	1	1	2.31	0.49	2.97	6.27	2.54
Hedgehog	-	-	-	-	-	-	-	2	0.00	0.00	0.00	0.00	0.16
Rabbit	-	-	-	-	-	-	1	-	0.00	0.00	0.00	0.54	0.09
Goose	-	-	-	-	-	-	-	-	0.00	0.00	0.92	0.18	0.09
Dog	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00
Cat	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00
Total	100												

*G1: OM, G2: YW, G3: YM, G4: OW, G5: OM, G6: OW, G7: YM, G8: YW, G9: OM, G10: YW, G11: YM, G12: OW

3.2. Priority diseases for top two important livestock

Currently, all livestock disease cases are diagnosed on clinical grounds only by local veterinarians and animal health professionals, and only ASF suspected cases have been confirmed by national laboratories (RAHO 1 and the National Centre for Veterinary Diagnostic [NCVD]). Therefore, it is very difficult to determine the disease names reported by the farmers in this study based on clinical signs only. Overall, cattle and chicken were identified as the top two important livestock. For cattle, gastrointestinal tract (GIT) infections, parasites and *Pasteurella multocida* were ranked first, second and third in terms of priority, respectively (Table 2).

Table 2. Top priority diseases for cattle

Cattle	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	Average
GIT	22	46	56	41	20	34	45	24	0	46	19	20	31.10
Respiratory	15	0	4	27	22	46	24	33	0	0	8	0	14.86
Parasites	56	9	32	17	46	12	19	31	11	46	11	28	26.40
Foot-and-mouth disease	7	22	2	11	1	3	13	4	0	0	0	4	5.55
<i>Pasteurella multocida</i>	0	11	6	4	11	3	0	9	63	9	60	48	18.63
Salmonella	0	0	0	0	0	0	0	0	27	0	0	0	2.24
Sunstroke	0	12	0	0	0	0	0	0	0	0	0	0	1.00
Urethritis	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Total	100	100	100	100	100	99	100	100	100	100	98	100	100

For poultry, Newcastle disease, *P. gallinarum* and GIT were considered to have a high economic impact to farmers, except for group 1, 2 and 8 (Table 3). Some groups (1, 2 and 8) did not have chicken in their households.

Table 3. Top priority diseases for chicken

Chicken	G3	G4	G5	G6	G7	G9	G10	G11	G12	Average
Newcastle disease	23	14	50	59	23	51	40	78	61	44.17
<i>Pasteurella gallinarum</i>	8	14	28	20	55	31	0	23	26	22.64
GIT	39	34	0	7	0	9	43	0	0	14.69
Respirator	31	33	21	11	0	10	9	0	0	12.74
Parasite	0	0	0	0	0	0	8	0	13	2.29
<i>E. coli</i>	0	0	1	0	23	0	0	0	0	2.57
<i>Salmonella gallinarum</i>	0	5	0	0	0	0	0	0	0	0.56
Skin	0	0	0	0	0	0	0	0	0	0.00
Influenza	0	0	0	3	0	0	0	0	0	0.35
Total	100	100	100	100	100	100	100	100	100	100

For group (1, 2, and 8), pigs play the second important source of their livelihood. Participants addressed that respiratory, GIT and foot-and-mouth disease (FMD) were the major important diseases for pigs (Table 4).

Table 4. Top priority diseases for pigs

Pig	Gr1	Gr2	Gr8	Aver.
GIT	29	20	39	29.11
Respiratory	28	55	24	35.74
Parasites	0	0	26	8.75
FMD	15	15	11	13.45
<i>Pasteurella multocida</i>	23	0	0	7.62
Salmonella	0	10	0	3.33
Sunstroke	6	0	0	2.00
Urethritis	0	0	0	0.00
Total	100	100	100	100

We also held a discussion with local vets. The local authority provides free foot-and-mouth and *P. multocida* vaccines twice-yearly

3.3. Impact of major livestock diseases on households

Livestock diseases impose a wide range of biophysical and socio-economic impacts on households that may be both direct and indirect. Pritchett et al. (2005) pointed out that the economic impacts of animal diseases can be categorized into six areas: production effects, market and price effects, trade effects, impacts on food security and nutrition, human health and the environment effects, and financial costs. In our study, the major impacts of livestock diseases were financial losses, low productivity, impact on animal/human health and

malnutrition. The magnitude of the impact on different household members was identified. Especially, older people and women are responsible for taking care of livestock while young men work in crop production, which is the main source of income for most household in the study area. If livestock become sick or die, it has a huge impact on these groups (older people and women).

3.4. Knowledge of farmers about disease transmission pathways

Overall, our study found that respondents have low level of knowledge about disease transmission pathways. Participants believed that transportation/human movement, direct contact and air-borne pathways play an important role in disease transmission between livestock (Table 5). However, by gender, women said that the air-borne pathway is the most important risk factor, while men said that direct contact was the most important risk factor for livestock disease transmission.

Table 5. Major disease transmission pathways

Transmission	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	Average
Food	12		4	10	16	8	16		13	6		13	10.88
Drinking source	9		5		16	8	10		7		17	13	10.58
Air-borne	11	8		13	5	8	19	4	13	15		19	11.55
Seasonal changing		14		8		11		11	13		15		12.00
Direct contact	15		16	8	13		11	14	13	11	10	19	13.05
Grazing	6	8	8			6	13	9	12	0	0	16	7.63
Transportation/human movement		7	12		10	11	18	17	13	13	18	13	13.10
Sharing the same needle (vaccination)		8			4		10			1			5.59
Poor animal hygiene								5					5.00

3.5. Understanding of antimicrobial and vaccine use

In general, farmers purchase drugs/antibiotics from veterinary drug stores when their livestock become sick. However, the drug dealers are not professional veterinarians and sell drugs based on what farmers describe as the clinical signs of their livestock. If the purchased drugs do not work, farmers return to the local drug stores to buy different drugs rather than call local veterinarians. Interestingly, farmers from Chieng Luong have a tendency to distrust local veterinarians as these veterinarians do not actively work for local community. Animal vaccines have not been used for livestock in the two communes. Most of farmers are not aware about the importance of immunization.

4. Conclusions and recommendations

- Cattle and chickens play a major role for farmers' livelihood in the two communes. The biosecurity level of small-scale farms is low to non-existent providing opportunities for the introduction, spill-over and spread of pathogens. The awareness and knowledge of farmers on potential disease pathways and the importance of biosecurity is low, and there is no or little motivation to change current practices. It is necessary to provide biosecurity training as well as educating farmers on antibiotics and vaccine use.
- Early detection and early reporting of diseases are also unlikely to happen given the current practices of farmers. This is exacerbated by the weakened veterinary system at commune and district level. The recent ASF outbreaks are an example of the rapid spread of a disease in a system where field veterinary services are weak. Farmers manage their livestock disease and outbreaks on their own.
- Older people and women are the most vulnerable to animal losses and their economic impacts and current training materials are not tailored to their low literacy level and their smallholder production system.
- Antimicrobials are widely used by farmers to prevent and treat animal diseases. Veterinary drug stores play a crucial role in the distribution of antimicrobials and in providing advice to farmers. Focused interventions are needed on rational use of antimicrobials by veterinary drug shop which are the main advisers and suppliers to farmers.
- Vaccines for FMD and *P. multocida* in cattle and Newcastle disease in chickens are freely provided by local authorities on a yearly basis, but the efficacy/quality of the vaccines and identification of serotypes have not been assessed for a long time. In order to support vaccination policies in Son La, these and other factors (e.g. effectiveness of cold chain) should be evaluated.

5. Reference

Pritchett, J. G., Thilmany, D. D., & Johnson, K. K. 2005. Animal disease economic impacts: A survey of literature and typology of research approaches. *International Food and Agribusiness management review*, 8(1030-2016-82471), 23-45.