



Important finding

AVHW's Capacity and challenges

and

Farmers' satisfied on services of AVHWs

2023



Table of contents

1. Introduction	0
2. Objectives.....	1
3. Materials and methods.....	1
3.1. 3.1 Review data and consult with stakeholders:	1
3.2. Study on technical capacities of VAHWs	3
3.3. Statistical analysis	5
3.4. Study limitations	5
4. Survey outcomes	6
4.1. Outcomes of stakeholder’s interviews.....	6
4.2. Outcomes of VAHWs interviews:.....	7
1. General information of VAHWs	7
2. Working as VVWs	7
3. Training and refreshment training.....	8
4. Services.....	8
5. VAHWs’ service challenges	10
6. Levels of satisfaction of their own work	11
4.3. Outcomes of farmers’ interviews:.....	12
1. General information of participants	12
2. Problems and finding services	12
3. VVWs’ services and satisfaction	14
5. Discussion	15
6. SWOT analysis of VAHWs’ network.....	15
6.1 Strength	15
6.2. Weakness.....	16
6.3 Threat	16
6.4. Opportunity	16
7. Conclusions and recommendations	16
7.1 Summary of conclusion:	16
7.2 Recommendations:	17
8. Acknowledgements.....	17

1. Introduction

In Lao PDR, farmers raise livestock including cattle, pigs, goats and poultry as a component of family income and nutrition. They provide an important source of cash income from the sales of animals and their products and remain important to the farming system by providing manure as fertilizer. Recent development in livestock production has led to increasing numbers of commercial farms being established due to the disease outbreaks with tremendous loss, particularly affecting small-scale farms.

Among the diseases that occur and cause the death of animals are important restrictions on animal husbandry in Lao PDR, especially common annual diseases, outbreaks of African swine fever and bird flu in pigs and poultry largely provoke health threat to small-scale farmers. In order to control this, the government of the Lao PDR has made many efforts to maintain biosecurity and banning the importation of pigs from neighboring countries, there is a law on animal husbandry and veterinary medicine, there are measures to control and eliminate temporary biosecurity, which is important, there are personnel, especially veterinarians who are on the front lines to solve disease infections and related parties also coordinate to help each other and participate in the prevention process proactively during disease outbreaks. Currently, the Ministry of Agriculture and Forestry, through the Department of Livestock and Fisheries, has also collaborated with the Food and Agriculture Organization of Laos (FAO Lao) to create a national African swine fever control plan as a guide to control African swine fever in Lao PDR.

Village veterinarians are community-based animal health workers who provide basic animal health care services to livestock farms in rural areas. Village Veterinarians in Lao PDR (VAHWs) especially in 3 provinces, 3 districts project targets: Tumlan District, Saravan Province; A number of Phon Khong Districts in Vientiane Province and Vieng Kham District in Luang Prabang Province have received training to support and advise on disease control and prevention. The training topics focus on technical assistance and animal health services such as: Vaccination and early treatment. However, due to the training that took place a long time ago and the training period was short. Therefore, they should be offered to upgrade their skills through re-training with support from the central and local government, INGOs, and DPs in terms of training and related equipment so that they have specific knowledge and skills to be sure and guaranteed to increase animal health care services.

In order to continue and connect in dealing with, controlling and preventing animal diseases related to the role of village veterinarians in working with the community at the local level, the AVSF organization in Lao PDR, which is a partner in implementing the BIG project, it has been proposed to the government, especially the Department of Livestock and Fisheries, to conduct a survey-research on the technical capabilities of the village veterinarians (VAHWs) in the target villages of the program to strengthen biosecurity measures in the pig farming sector to control African swine fever in the Lao PDR in order to create an understanding of the quality and capabilities of the village veterinarians (VAHWs) that they have been working on until now.

Between April to June 2023, Department of livestock and fishery, ministry of agriculture and forestry of Laos with supported by AVSF-Laos conducted interview village animal health works (VAHW) and farmers in three districts of three targeted provinces, Viengkham district in LouangPrabang, Phonhong district in Vientaine and Toumlan district Salavan province. This conduction to focus asset on technical constraints and possible suggestions and advices for improving of AVHWs' service.

74 VAHWs in total from three provinces were interviewed. In order to continue and connect in dealing with, controlling and preventing animal diseases related to the role of village veterinarians in working with the community at the local level, the AVSF organization in Lao PDR, which is a partner in implementing the BIG project, it has been proposed to the government, especially the Department of Livestock and Fisheries, to conduct a survey-research on the technical capabilities of the village veterinarians (VAHWs) in the target villages of the program to strengthen biosecurity measures in the pig farming sector to control African swine fever in the Lao PDR in order to create an understanding of the quality and capabilities of the village veterinarians (VAHWs) that they have been working on until now.



2. Objectives

The specific objectives of the analytical study were to:

- Assess the technical constraint, the sustainability, and the possibility of improvement for Village Animal Health Workers (VAHWs);
- Capture good practices, challenges, and constraints of the VAHWs and provide recommendations to improve their roles in terms of disease surveillance, reporting, and control; and
- Carry out a SWOT analysis of the status and situation of VAHWs' network in Lao PDR. Map of target districts

3. Materials and methods

3.1. 3.1 Review data and consult with stakeholders:

The process of review data and consult with stakeholders at the local level, after the research team has completed the contract with the AVSF-Lao organization, has compiled information about the project from the AVSF-Lao organization such as: MOU of the Project to strengthening biosecurity measures in pig sector to control African swine fever in the Lao PDR and, there are also relevant legislative documents in Lao PDR to study, collect initial data as a basis for preparing questionnaires in field data collection.

Through the review of the documents, it can be observed that currently the Lao PDR has the Law on Animal Husbandry and Veterinary Medicine No. 08/ສລຸ, dated November 11, 2016, which in the said in Article 4, No. 19 about VVWs, "VVWs mean volunteers who have received a short-term training certificate on animal health from the relevant unit" but have not specified the responsibility clearly yet.

In the handbook for VVWs, is mention the role of the VVWs in clearly stated which includes 6 main topics such as: 1. Coordinate with the head of village and the villagers to organize the seasonal vaccination process to prevent disease outbreaks, but should not vaccinate sick animals; 2. go to check the sick animals at the request of the villagers, choose the right treatment method to help the animals get better, the VVWs must follow up on the animals that have been treated to know the results of the treatment; 3. Record livestock information in the village: of animal birth, death, disease and sale. From this record, the VVWs can help the villagers and farmers to solve problems

and increase production; 4. Report the outbreak of the disease to the animal husbandry unit of the district. In case of necessity, the VVWs must help the farmer who raises the animal to send the parts of the animal to the animal disease research laboratory to diagnose the disease; 5. Must ensure that foreign animals or newly purchased animals do not enter the village. These animals must be kept in isolation for a period of 2 weeks before being allowed to live with the domestic animals; 6. Village veterinarians must raise their own animals with good raising methods to serve as an example for other villagers to see in order to improve the way of raising animals in the village.

In the project MOU, it is stated in the background section of the project that "The four countries targeted by the project are respecting their legal obligations of disease reporting and surveillance towards the world animal health organization (WOAH) including Laos PDR. For the countries affected by the ASF epidemic, to implement various measures to prevent further spread of the epidemic. Therefore, each country will initiate an ASF national control program. And in the overall objective of the project, it is stated that (to contribute to the strengthening of ASF prevention and control program in the Lao PDR).

The process of consultation with local stakeholders is: Along with studying the information from the documents, the team also coordinated with the research team in Cambodia to prepare the inquiry form by coordinating with the AVSF in Laos from time to time. After completing the preparation of the questionnaire, the team made a proposal asking for approval to work in the 3 target provinces of the project by making a proposal to the PAFO of 3 provinces to notify the 3 target district of the project by attaching the questionnaire and detail of agenda.

Through consultation with the PAFO and Animal Husbandry section in Luang Prabang Province, it was found that in the work of animal husbandry and veterinary medicine at the provincial level, there is an animal husbandry sector that has performed specific duties in this work by developing the Development Plan of MAF according to the 4 specific goals specific DOLF plan. The main work that has been implemented is to promote animal husbandry for domestic consumption and to produce goods, collecting information about animals, animal health, animal diseases, organizing training on various topics about animal husbandry and veterinary medicine for city staff and VVWs when there is a project to support. Therefore, it is not done continuously because of the lack of budget, the reporting system is still not systematic because the data collection is not yet systematic, especially the VVWs data is still old data, there is no update, there is also lack of equipment to collect data, such as computers and specific personnel, the VVWs development plan is not yet formalized.

Through consultation with the DAFO Vieng Kham, it was found that are being followed the directives of the central and the province. At the district level, there is a animal husbandry and veterinary unit, which has active and strong personnel who are capable of helping to solve animal health problems for villages in their districts. The problem at the district level is the lack of equipment such as vehicles, computers and personnel, the reporting system is not continuous, data collection is done but not updated. The good point in Vieng district is that AVSF and Agrisud have been implementing projects together with the district for a long time, so they have some budget to support their work.

Through consultation with the PAFO Saravan, it was found that there is a animal husbandry and veterinary unit and personnel are already in place, but the program for surveillance and control of animal diseases as well as the program for promoting VVWs are not yet available. Therefore, it is

necessary to create. The problem is lack of budget, lack of service equipment, lack of information, so reporting is not continuous.

Through consultation with the DAFO, Tumlan also found that there is a Animal Husbandry and Veterinary Unit which has active and strong personnel who are capable of helping to solve animal health problems for villages in the district. The problem is lack of budget, lack of service equipment such as vehicles, computers and personnel are not enough, the reporting system is not continuous, data collection is conducted but not updated.

The DAFO Phone Hong see that the organization structure and personnel are good opportunity as the city is close to Vientiane Capital and there is a convenient road to get from village to village. As for the operation plan, it is similar to the two districts, according to the guidelines of the central and provincial. The actual work of the district is: to follow up and encourage the farmers who raise animals and VVWs within their district by supporting funds from the project that came to be implemented in Phone Hong, the special point in Phone Hong is that there are quite a lot of small and medium sized pig farmers. The problem is lack of budget, lack of service equipment, data collection is conducted but not updated, therefor reporting not continues, lack of development plan to promote animal husbandry and VVWs therefor lack of VVWs.

3.2. Study on technical capacities of VAHWs

3.2.1 Size selection and sample size:

The selection of the scope has selected 3 provinces that are the target provinces of the project to strengthen biosecurity measures in the pig farming sector to control African swine fever (BIG) in Lao PDR, especially the three districts: Tumlan District, Saravan Province, Phon Thong District, Vientiane Province and Vieng Kham District, Luang Prabang Province. For this study-analysis, our team collected the number of villages with recent outbreaks of ASF, as well as the districts with the number of small-scale livestock farmers and the target villages of the BIG project with the support of the AVSF organization.

The Village Veterinary/Village Animal Health Workers (VAHWs) will be selected from the list provided by the Department of Agriculture and Forestry as well as the District Veterinary Unit of 75 people as expected; The selection will select those who are active and those who are not active in the previous work to come to interview according to the ratio of 70:30 which is equal to (53 active people and 22 inactive people) in 3 provinces, which will be 25 people in each province. The criteria for selecting VAHWs to be interviewed are as follows:

- 1) be a permanent resident in the village,
- 2) have more than 3 years of work experience,
- 3) be active in providing animal health service and control, and
- 4) be willing to learn and disseminate knowledge and experience.

In addition, our team also selected 60 small-scale livestock farmers to interview in each province, of which 20 were selected in each province by village chiefs. The selection of farmers is based on the following criteria:

- 1) Permanent resident in the target district and keep livestock whole year round,
- 2) Own more than 2 cattle, 2 pigs, and 50 poultry, and
- 3) at least 3 years of experience in keeping livestock.

Reasons and institution to select for VAHWs:

The reason for choosing the village veterinarians (VAHWs) and small-scale livestock farmers to be interviewed is because they are the ones who are at the front in contact with animals/animal health care and know the reality of the livestock in the community well, also to know the knowledge and professional skills, the service in maintaining animal health of the village veterinarian, the coordination-connection between the two groups, the reporting/sending information of the village veterinarian normally or not normally to the upper level.

The reason for choosing the village veterinarians (VAHWs) and small-scale livestock farmers to be interviewed is to know the strengths, weaknesses and challenges to bring to research-analysis, as information for the project to strengthen biosecurity measures in the pig farming sector to control African swine fever in the Lao PDR as well as the AVSF-Laos as a way to find better solutions to weaknesses in the future and enhance the existing strengths. This is to maintain the quality of animal husbandry, especially for pig farmers, and to control African swine fever in the Lao PDR gradually. Finally, pig farmers can generate more income for households, guarantee of food security and nutritious, and can gradually boost the economy of the district, province, and the nation.

3.2.2 Development of questionnaires and pre-test:

Our team, together with the team in Cambodia, jointly developed an inquiry form which includes an inquiry form for village veterinarians and an inquiry form for small-scale farmers, then the team translated both sets of inquiry forms received from the team in Cambodia into Lao language.

3.2.3 Submission of questionnaires and table of contents for approval:

After completing the translation of the inquiry form into Lao language, it was sent to the AVSF-Lao for endorsement and approval. After receiving the approval, the research team sent the documents to the AVSF-Laos, which included: an inquiry form, a letter to the Provincial of Agriculture and Forestry, schedule of work and draft report to make a proposal and submit it to the Provincial of Agriculture and Forestry in each province.

3.2.4 Training enumerators:

After the inquiry form was approved by the AVSF-Lao, the research team organized a training on how to use the inquiry form for team members, especially veterinary students from Nabong University for 2 days to understand and know how to ask questions to get adequate and complete answers.

3.2.5 Conduction of field work:

The independent research team consists of 4 people from the center (team leader 1 person, senior expert 1 person, 2 students from Na Bong University, majoring in veterinary); 9 person from the local (1 person from each Provincial of Agriculture and Forestry and 2 person from each District of Agriculture and Forestry office in 3 district).

The process of field work, when the team went to each province, they contacted the Provincial of Agriculture and Forestry and the District of Agriculture and Forestry Office in accordance with the letter of intent that was sent before. The purpose of meeting with the leadership of each organizations to report on the goals and objectives of the team's work and to ask for guidance in appointing 1 employee from the Provincials of Agriculture and Forestry and 2 from the District of Agriculture and Forestry office. Also discussed at some points to exchange some information such

as: The organization system, communication lines of veterinarians at each level and reporting channels for sending and driving information about livestock, animal health and animal disease outbreaks from time to time, including problems and challenges.

Before going to the villages, the senior experts trained the district and provincial officials who were appointed to participate in data collection by spending 1 day in each district.

After that, they jointly planned to go down to the village based on the following conditions: 1)

Villages with active veterinarians and inactive veterinarians; 2) villages without a veterinarian; 3)

Villages with an accessible road. As for the villages that cannot be reached, the team chose the nearest village to gather at the village with an accessible road. After the team has agreed on

planning, 1 district staff will be the coordinator to the village head in each village to inform the team's work plan to schedule a time to meet with the veterinarian and the people raising animals.

Some villages that cannot be contacted by phone will travel directly to the village, which will take 2 days, some districts will take 3 days.

The method of data collection/interview is divided into 2 steps: Step 1 is a group meeting including the village head, village committee, village veterinarian and livestock farmers to inform the purpose and methods of working with the village; Step 2: interviewing the village veterinarian and interviewing the farmers raising animals through the method of individual interviews (1 to 1) using the interview form prepared by the team. Every evening after returning from the villages, the team members have a meeting to learn lessons in the work and review-check the collected information is complete or missing and at the same time the team leader also gives clarification or advice if some questions or answers are not clear.

3.3. Statistical analysis

In the statistical analysis, the team used the SPSS program in the analysis. Procedures after the team completed the field trip and received answers from the interviews of both groups: village veterinarians and small-scale livestock farmers in 3 districts. They were entered into the SPSS program to analyze and calculate in terms of statistics, using 5 days, which has details attached herewith.

3.4. Study limitations

Limitations of the study: Some of the target village project are remote areas. Access roads is difficult and cannot be reached because the roads are slopes and potholes and big plus.

Appointments with people and veterinarians are mostly difficult because they do not meet on the scheduled time and we also found that there are still many villages without VVWs.

4. Survey outcomes

4.1. Outcomes of stakeholder's interviews

Through consultation with relevant parties at the central and local levels, it has been seen that there are good points in the implementation of the control of the epidemic of ASF and bird flu in pigs and epidemics in animals. The government of the Lao PDR, especially the Ministry of Agriculture and Forestry, has made efforts to maintain biological safety in the pig farming sector, which has banned the importation of pigs from neighboring countries. Which is the Department of Livestock and Fisheries, the Veterinary Division and the PAFO/Vientiane Capital are responsible for inspection and quarantine; there is a law on animal husbandry and veterinary medicine; there is a manual for the VVWs that clearly states the duties of the VVWs, which includes 6 main points as below:

1. Coordinate with the head of village and the villagers to organize the seasonal vaccination process to prevent disease outbreaks, but should not vaccinate sick animals; 2. go to check the sick animals at the request of the villagers, choose the right treatment method to help the animals get better, the VVWs must follow up on the animals that have been treated to know the results of the treatment; 3. Record livestock information in the village: of animal birth, death, disease and sale. From this record, the VVWs can help the villagers and farmers to solve problems and increase production; 4. Report the outbreak of the disease to the animal husbandry unit of the district. In case of necessity, the VVWs must help the farmer who raises the animal to send the parts of the animal to the animal disease research laboratory to diagnose the disease; 5. Must ensure that foreign animals or newly purchased animals do not enter the village. These animals must be kept in isolation for a period of 2 weeks before being allowed to live with the domestic animals; 6. Village veterinarians must raise their own animals with good raising methods to serve as an example for other villagers to see in order to improve the way of raising animals in the village.

There are development partners for example (FAO, AVSF...); There is a 5-year development plan of the Ministry of Agriculture and Forestry; There are projects to support the development plan and currently a national ASF control program is being created as a guide to control ASF in the Lao PDR through cooperation between the Department of Livestock and Fisheries and FAO Lao organization.

Based on the cooperation of various government units at the central and local levels, especially the Department of Livestock and Fisheries, the PAFO and the DAFO, they have encouraged, monitored and organized training to strengthen the village level in order to establish a network of village veterinarians based on principles and procedures in each village across the country.

Issues/Challenges: Existing legislation is not comprehensive and continuous due because lack of budget and insufficient personnel. Therefore, the dissemination does not reach the local people/those who actually do the work as much as it should. The understanding of the relevant laws/legislation of the employees is not yet deep. In addition, the employees are transferred.

Technical limitations: Inadequate service equipment (provincial and district level data collection equipment, basic disease research equipment...) personnel is also not sufficient.

Sustainability: If we look at the sustainability at the provincial and district levels, we cannot say or guaranty because there are many technical limitations, coupled with insufficient personnel. The personnel that are available need to increase responsibility and professionalism

4.2. Outcomes of VAHWs interviews:

1. General information of VAHWs

74 VAHWs from three target districts of three provinces as LuangPrabang, Vientiane and Salavan province. The mostly participants are male as over 86.4%, while majority of them are middle age adult 62 of 74 VAHWs. It is also so interesting to note that only 3.62% were graduated college university and more than half of VAHWs finished primary school.

Table 1: General information of VAHWs

	LouangPrabang	Vientiane	Salavan	Overall
Gender, n (%)	32	7	35	74
Male	26	4	34	64
Female	6	3	1	10

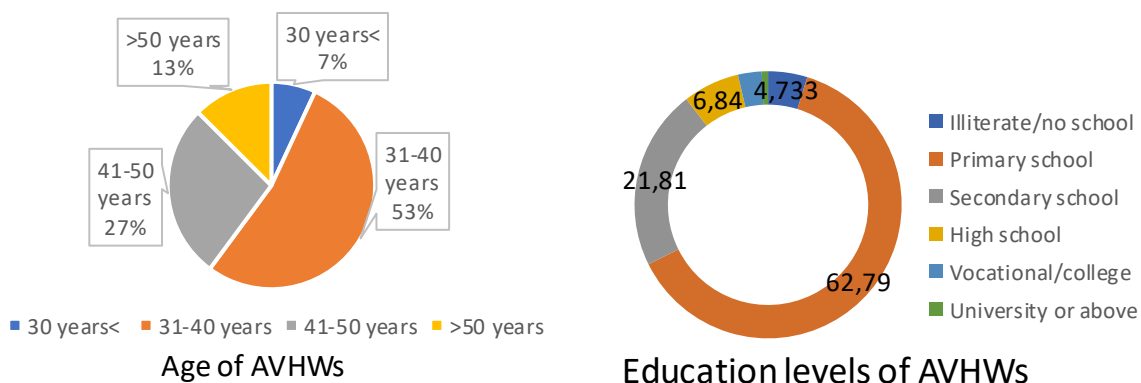


Figure 1: Age and education levels of VAHWs.

2. Working as VVWs

Long experience working as VAHWs can be better providing services to farmers and other customers. However, new VAHWs that have experience between one to ten years can be fresher works. According to survey, we found that 49/74 or 66.6% VAHWs working as VAHWs for between one to ten years and 11 to 20 years experience contributed to 28.37%, while only four of them have VVWs' experience more than 20 years.

Table 1 - Share of animal health service in total household' s income, n (%)

	Luang Prabang	Vientiane	Saravanh
Under 25%	63,6%	28,7%	53,3%
25-50%	36,4%	57%	40%
51-75%		14,3%	6,7%
More than 75%			
Do not know/no answer	19%		9%

3. Training and refreshment training

To make sure VVWs have a capacity and the right to provide services to farmers in their perspective areas with certain topics and practices. However, there 64 VVWs or 86.4% attended trainings. Training on animal disease, treatment and vaccination were the main topics while other related skills were rarely mentioned as shows in **figure 2**. The training happened for several years ago, thus some VAHWs do need to refresh the rules and skills. However, only 25 VVWs or one third of them had a chance for refreshment.

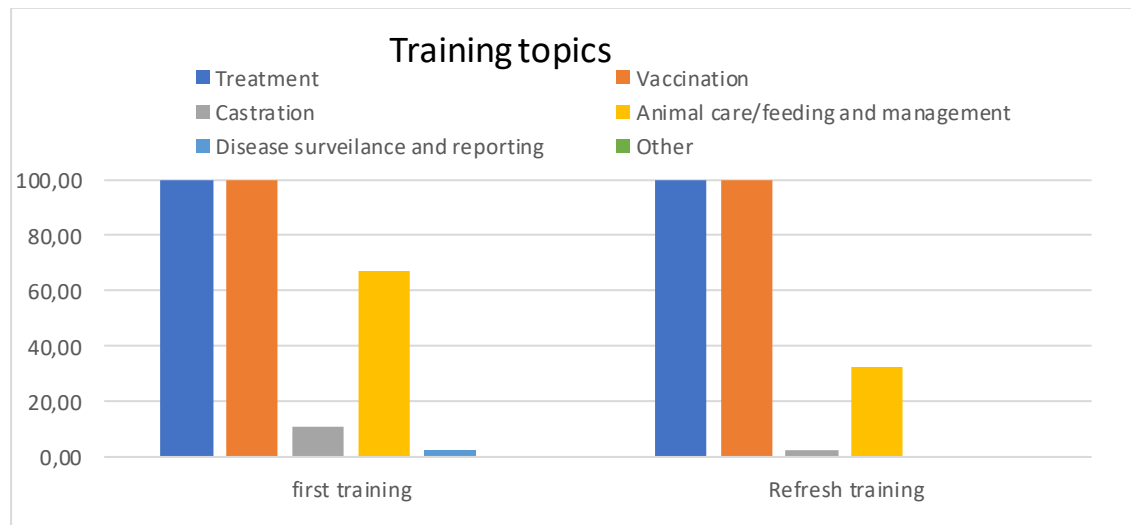


Figure 2: Training topics of who participated the first and refreshment.

4. Services

Point 1. Coordinate with village chief and livestock farmers to organize the vaccination process in time for the season. In this point, it can be done only in 8 villages and have done by 12 AVHWs or 16.2%. This happened to intervention project villages. For other villages vaccination campaign would be done by livestock farmers while 45 VAHWs or 60.8% have never done organizing vaccination campaign at the perspective villages for decades.

Point 2. Check the sick animals' health and treatment according to the request of the villagers. Checking and animal health and choose the right treatment is main duty of VAHWs. After treatment and providing advices to livestock owners, VVWs may follow up in order to know the results of the treatment. Even this duty are vital action, there are only 18 VAHWs or 24.32% of 74 VAHWs have done this and the rest are inactive.

Point 3. Provide advices. VAHWs' duty also include proving advices the related to animal health and livestock husbandry such as animal health, animal health care, feed and management. For this service can be seen only 14 VAHWs or 18% of them. At the same time only 2 VAHWs have done castration on pigs and large ruminants.

Point 4. Veterinary drug store. Veterinary drug stores at villages, namely villages that long distance to the main town of districts play important rule reducing rate of animal mortalities. There are only four villages that this store available or 4 VAHWs selling vet drugs and equipment while other VAHWs may

purchase vet drugs and equipment from retail shops and district agriculture and forestry office when they needed.

Point 5. Record livestock data information in the village: Animal data such as number of each type of animal, death, disease and sale can help farmers to solve the problems and increase the production. However, those data is not found or have done with no single VAHWs. The data of animals in the villages can be found on annual report the prepared by village authorities once a year.

Point 6. Disease outbreak and Reporting

According to interview of VAHWs, can be found that during disease outbreak, 44.2% of VAHWs recommended livestock owners purchase antibiotics to inject all animals that available at a farm immediately. Only 18.65% of VAHWs report disease outbreak and situation to village authorities, district veterinary unit and provincial levels. In case of necessity, the VVWs must help the farmer who raises the animal to send the parts of the animal to the animal disease research laboratory to diagnose the disease. In this case it can only be done in some villages. Most of them have not reported, so the information at the district and provincial level is very old because they do not receive updated information from the village

Point 7. Sample collection

In Tumlan District, 2 VVWs to collect stool and blood samples for testing,. As for the others, they have never collected animal samples for examination yet, because they haven't had the opportunity, and they still confidence themselves.

In Phone Hong District, VVWs never collected samples.

In Vieng Kham District, only 1 VVW used to collect stool and blood samples. The others have never collected animal samples for examination yet, because they haven't had the opportunity.

Synthesis of VVWs action in case of disease outbreak

If compared as a percentage of the behavior of the village veterinarian in 6 points in the questionnaire form such as: 1) waiting for help from outsiders; 2) notify local authorities; 3) kill infected animals by themselves; 4) notify the district veterinary officer; 5) Immediately treat animals that are found to be sick; 6) Collect the parts of dead animals that necessary information to send to the central laboratory: In Luang Prabang province: 37% treated immediately; 27% did not answer; 27% informed the provincial and district organizations; and 9% told to keep the animal and monitor the symptoms. If the animal dies, notify the special authority to come and take a sample for analysis.

Vientiane province: 67% treated immediately, 33% did not respond, in currently do not call the district veterinarian because they complaint the medicine is too expensive.

Sarawan province: 28.6% treated immediately, 23.8% informed the village chief, 23.8% informed the province, 9.5% collected the necessary samples and sent them to the central research laboratory (Animal Husbandry Department), and 14.3% did not respond. Most of the people bought the medicine to treat themselves, If it's good, it's okay. If it's not good, it's dead.

In 2018-2019, there was an outbreak of African swine fever in Tom Lane, Phone Hong, and Vieng Kham Districts. The farmers of livestock raising were affected, especially financially, some families owed a lot to banks or microfinance institutions.

5. VAHWs' service challenges

Knowledge, all of VAHWs have complained that they limited knowledge on animal health care, treatment and common disease diagnosis. Fewer times and long time ago participated training can be the reasons of knowledge limitation. This can be barriers to provide on animal health, animal care and management. Thus 100% of them desire to refresh training.

Access to drugs and Medicines also the main challenge of VAHWs as 81.1% hardly access to drugs, medicines and vet equipment. Respective villages may located in remote area with dirt road especially in Viengkham district, Louang Prabang. The VAHWs travel more than two hours to shops or district agriculture and forestry to purchase drugs. However, this can be happened during dry season only. During interview, VAHWs also complained that there are fewer drugs and Medicines providers at their areas. For example, there are only available in DAFO and one private shop in Viengkham. It's shared the same situation in Toumlan district, Salavan province.

Quality of drugs and medicine, 25 VAHWs or 33.8% facing drugs' quality mainly vaccines. This means vaccines need to store in refrigerator with certain temperature while electricity in their villages like drop / cut for days especially during dry season. This why VAHWs not store vaccines at home. Some medicines no label in Lao language, it's hard to read dosage and expiration date.

Attitude of livestock owners, this challenge is second main barrier for VAHWs' service for 90.5%. As majority of farmers are subsistent farmers, free roaming raising system is common seen. They like to treat animals when sick more than prevention. This can be seen from number of animal that vaccinated. Farmers also would like to treat sick animals by themselves with inappropriate dosage of antibiotics, or treatment. They may call to VAHWs only serious situation, so sometime it is too late. This farmers may blame to quality of drugs and services of VAHWs.

Other challenges such as payment of services, resources of VAHWs and geographic can see the proportion in figure 3. However, payment of service is more complex if compare to resources for operation and geographic.

83.8% of VAHWs facing payment services with main reasons. Farmers preferred to pay by dose because they have few livestock. For example, hemorrhagic septicemia vaccine on cattle injection. There are 15 dose in one bottle while farmers injected only five doses. They preferred to pay five dose instead of 15 dose even 10 doses go to a bin. Some farmers may delay to pay service for months after using VAHWs' service.

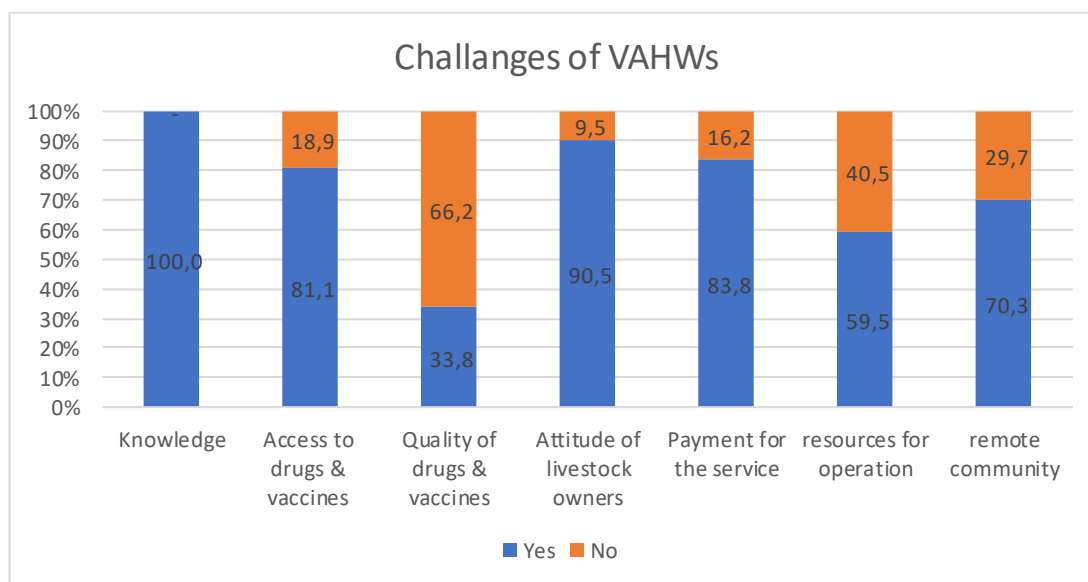


Figure 3: Challenges facing by VAHWs during VWs' interview.

6. Levels of satisfaction of their own work

Self-assessment and rating by VWs of their service and proof of service limitations of VWs were reported as follow:

Vientiane Province: Give self a rating of 4 = 2 people, because there are very few mistakes and always go to the time that people want, give themselves a rating of 3 = 5 person because is not confident on knowledge because he have never join trained.

Salavan Province: Give self a rating 5 = 2 person, because they think they do a very good job, give self a rating 3 = 19 person, because they can't heal every time and lack expertise, give self a rating 2 = 8 person, because they don't trust themselves at all, give self a rating 1 = 2 person, because they don't treat animals at all, do not give self-rating for service 4 person, because they said that they do not know how to rate themselves because they rarely give any service to the farmers.

Luang Prabang Province: Give self a rating 5 = 2 person, because they have done full duty, give self a rating 3 = 18 person, give 2 = 5 person because they didn't go to provide any service, give 1 = 3 person because they didn't go to provide services at all, don't give any self-rating 4 person, because they said that they do not know how to rate themselves because they rarely give any service to the farmers.

Province	Rating (5: very good to 1: not good at all)					
	5	4	3	2	1	Not answer
Vientiane province	0	2	5	0	0	
Salavan	2	0	19	8	2	4
LouangPrabang	2	0	18	5	3	4

Table 2. Levels of satisfaction rated by VAHWs

4.3. Outcomes of farmers' interviews:

1. General information of participants

	LouangPrabang	Vientiane	Salavanh	Overall
Gender, n (%)	20 pp	20 pp	21 pp	61 pp
Male	19 pp=95%	15 =75%	19 =90,5	53 =86,9%
Female	1 pp=5%	5 =25%	2 =9,5%	8 =13,1%
+/- Age, Ave.±SE				
<30 years	2 pp=10%	3 pp=15%	3 pp=14,2%	8 pp=13,1%
31-40 years	6 pp=30%	3 pp=15%	4 pp=19,1%	13 pp=21,3%
41-50 years	7 pp=35%	10 pp=50%	4 pp=19,1%	21 pp=34,4%
>50 years	5 pp=25%	4 pp=20%	10 pp=47,6%	19 =31,2%
Education level, n (%)				
Illiterate/no school				
Primary school	15 pp=75%	4 pp=20%	13 pp=61,9%	32 pp=52,4%
Secondary school	5 pp=25%	8 pp=40%	6 pp=28,5%	19 pp=31,2%
High school	0	6 pp=30%	1 pp=4,8%	7 pp=11,5%
Vocational/college	0	2 pp=10%	1 pp=4,8%	3 pp=4,9%
University or above	0	0	0	0
Comparison of total household income from animal sales, n (%)				
Under 25%	1 pp=5%	1 pp=5%	12 pp=57,2%	14 pp=22,9
25-50%	5 pp=25%	3 pp=15%	6 pp=28,5%	14 pp=22,9%
51-75%	3 pp=15%	7 pp=35%	1 pp=4,7%	11 pp=18,2%
More than 75%	11 pp=55%	9 pp=45%	2 pp=9,6%	22 pp=36%
# years of experience, Ave.±SE				
1-10 years	6 pp=30%	10 pp=50%	9 pp=42,9%	25 pp=40,9%
11-20 years	5 pp=25%	5 pp=25%	2 pp=9,5%	12 pp=19,6%
21-30 years	6 pp=30%	3 pp=15%	7 pp=33,3%	16 pp=26,3%
>30 years	3 pp=15%	2 pp=10%	3 pp=14,3	8 pp=13,2%

Table 3. General information of farmers.

2. Problems and finding services

Common and new disease farmers facing, different type of livestock facing different common diseases which occur certain time of years. 100% of farmers spoke out that they are still facing with annual diseases. Ducks, chicken and turkey are common poultry raising in surveyed areas. New Castle, Infectious bronchitis, duck plaque and fowl cholera are common disease is of poultries in that zone, while *Ascaridia Galli* is common parasite that can be found in black yard chicken.

CSF, ASF and MFD still threaten pig population in targeted districts. Especially, ASF outbreak between 2019 and 2020 which killed almost pigs in villages. Today, those

diseases still occur in some villages even not yet official confirmed by authorities but signals of disease similar to ASF.

MFD, Hemorrhagic Septicemia and lumpy skin disease are common cattle disease. Even vaccines to against these diseases available at their areas, number of large ruminant the received vaccines still low.

Swollen joints on pigs and cattle, red urine (*Bacillary hemoglobinuria*) can be new diseases to farmers.

Technical support challenges, 56 interviewed farmers or 93.33% experienced difficulties lack of technical support as do need access to services from DAFO or VAHWs and to be trained on animal disease treatment and fodder.

52 farmers or 86% **lack of resource feeding** animal, pasture for cattle for example. During dry season running through November – May of each years, cattle were roaming on bare ground especially in Viengkham district, LouangPrabang. Prices of commercial feed increases day by day also to be vital cause of lacking feed for pigs and chicken.

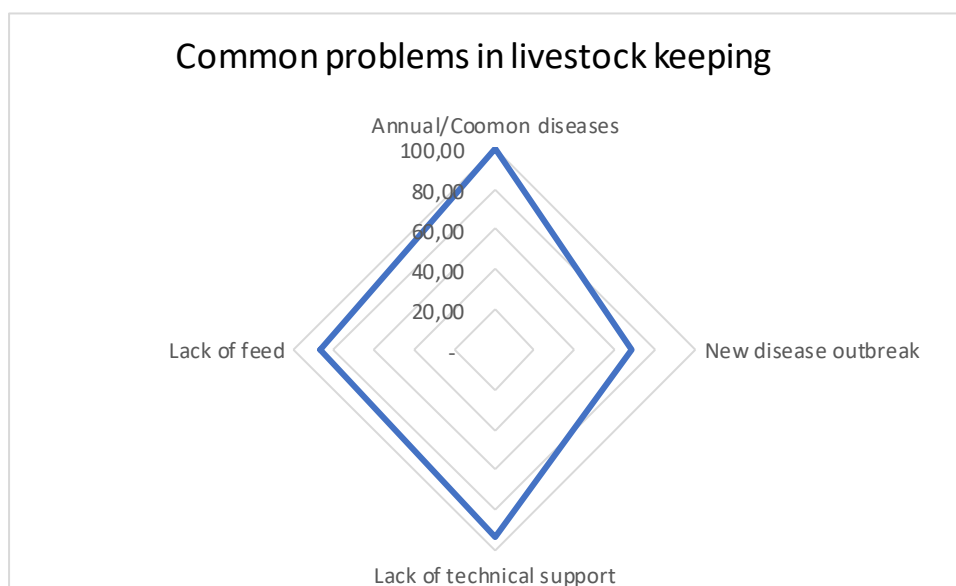


Figure 4. Challenges of livestock raising raised by farmers.

Finding help and services

When farmers facing difficulties, 85.25% of them direct to input suppliers such as commercial shops which selling animal feed and other vet medicine and equipment then 81.97% of them try to solve problems by themselves, while only almost one third (29.51%) asked help from VAHWs and district vets for 40.98% as show below.

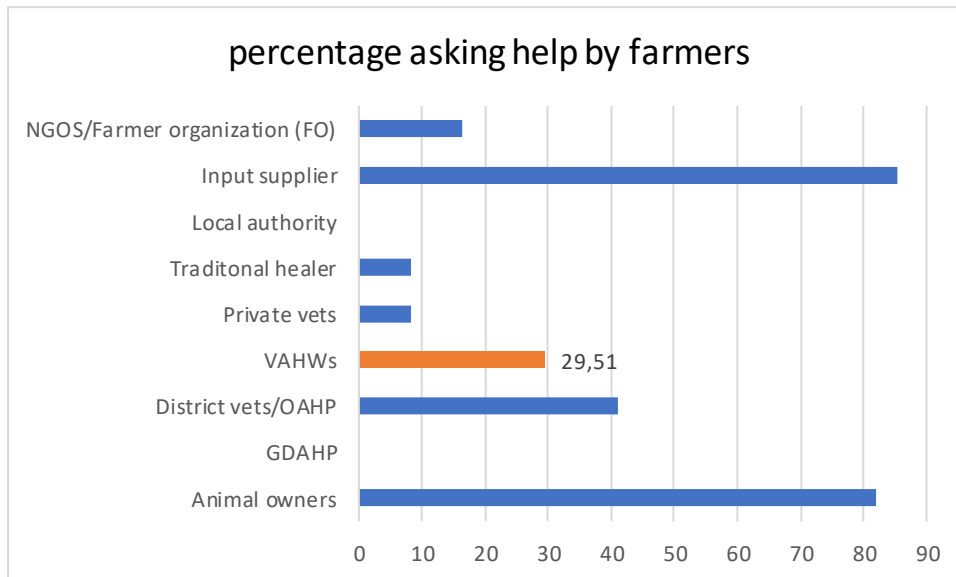


Figure 5. Proportion of each organization that farmers asking help when facing problems.

3. VVWs' services and satisfaction

Services that VAHWs provide in general are field visit for treatment, vaccination and provide advices and related information on animal health.

Field visit for treatment and vaccination, according result of farmer interview we found that when farmers asking help, VAHWs arrived their farm within 12 hrs. This confirmed by 12 farmers or 66.66% of 18 farmers or who asked help from VAHWs.

The information delivered by VAHWs during farm visit is simplified and limited; just name of possible disease and how to take care after treatment. 88.88% of VAHWs who visited the farms no return to monitor after treatment.

Satisfaction of services, one third or 33.33% of farmers who received services of VAHWs very satisfied. This is because fast and reasonable price and 61.11% of them for levels of somehow satisfied and satisfied combination and only 5.65 % were complained.

5. Discussion

Animal keeping and its production system. Animal care and animal husbandry systems. Farmers raise animals according to the traditional customs and subsistent with long experience. Poultry, cattle, goats and pigs are common seen in villages. Poultry, namely chicken is farm animal that sensitive in disease as it died almost every single year.

Subsistent and small-scale farmers; cattle raising is common seen and available almost every household in Viengkham District, Louang Prabang Province. Cattle may keep in “Sanam” and free roaming during at fallows, pasture and forestry and keep in cattle shed at night.

For pig farming systems in Phonhong district, mainly for commercial purposes. This activity was connecting to tradition alcohol production. Waste of alcohol production is main pig feed at alcohol produced communities. This can be reduce proportion of pig raising cost.

In terms of animal health care, most of the farmers are not interested in vaccinations to prevent all kinds of animal. This is because they concerned efficient of vaccination. Therefore, they focus on sick animal treatment. In addition, animal raising as free roaming and grazing facing difficulty to catch for vaccination.

Main task for VAHWs Through collected information from interviews district veterinarians, animals raising farmers and VVWs, it can be seen that the main duty of the VVWs are: animal treatment, provide advices to farmers and collecting livestock husbandry data then propose report to district vet unit. The reporting lines and direction are not yet clear. Thus, VVWs report to each organization when asking only.

Networking. In Toumlan district, Salavan province, Department of livestock and Fisheries, the PAFO and DAFO are public sectors that working and support VVWs by cooperated with development partners such as the WV-Lao Organization, AVSF and other international organizations.

In Viengkham district, LouangPrabang, VVET-2 project, AGRISUD International are implementing on animal health and VVWs’ capacity since couple years ago.

In Phonhong district, Vientiane province, department of Livestock and Fisheries, the PAFO, the DAFO are the main units in to supporting VVWs with coordination and support fund from domestic and international development partners.

6. SWOT analysis of VAHWs’ network

6.1 Strength

VVWs are needed and required of livestock husbandry communities. VVWs play vital rules for reducing animal mortality rates. Farmers also satisfied on service cost and ready to pay if their animals are safe;

It can also be seen that the district veterinarian has a high potential to support farmers. DAFO-vets can provide training, advices medicine and vet equipment.

During field visit, the team found that there are youths interested to be VVWs in the future. The youths can be trained full package of VVWs then provide proper service to livestock owners in their perspective areas.

6.2. Weakness

Miss conception and doubt of vaccination on farm animals are still main discussion topics that need to be cleared for farmers. Vaccination campaign should be combined with other biosecurity measurement rather than vaccination itself.

Knowledge of animal management and animal health care is also another concern of VVWs. This can be solve by conducting refresh training. Inadequate vet equipment and inactive of VVWs are high proportions if compared to active ones.

The system for collecting data on animals and animal diseases that occur each year and animal disease outbreaks in each period is still lacking and is not yet a complete system.

6.3 Threat

Due to increased negative perception/ lack of confidence of farmers towards the village veterinarians and their role, the demand might decrease in the future

6.4. Opportunity

Currently, Lao government has agreement on animal trading with neighbors. Many livestock farmers are supported shifting subsistent farmers to commercial farmers and livestock activities became priority of poverty reduction in some communities. VAHWs also received promoted by public sectors and inter organizations. VVWs in the future may not only to be train specific capacity, also receive equipment and tool. Connecting to vet national and international network will be seen in soon future.

7. Conclusions and recommendations

7.1 Summary of conclusion:

It was found that most of the animal health service management of the village veterinarians is not yet good and not according to the principles:

- In the management of equipment, medicines and medicine storage materials, there is still a shortage of things that are found in some villages such as: 1 small ice bucket, some medicines such as antibiotics, anthelmintic and vitamins, but most of the smallest things are not there at all;
- In the service of the village veterinarian, most of them will not do their own work to the fullest, which accounts for about 85% of the number of village veterinarians and people don't like to communicate with them because they say they don't come on time when they call. Therefore, the people's way out is to call the people who raise animals, who know and are familiar with each other, tell each other the symptoms and advise each other to use their own medicine according to their experience and get results, or call the district veterinarian, the district agricultural store, Found some villages with experienced and active village vets who are very old (65-70 years old and above)
- In collecting information and reporting from the village veterinarian to the village chief, there is still a lack/non-existent. Some villages have but on mouth communication, lack of written records, and lack of reporting at the village-to-district level is a common practice; It is found that most of the district veterinarians will call/write a message to the village veterinarian if there is one, or call the village head when there is a need for information/about epidemics and so on.
- The research team found the strength of the district veterinarian in each district is to play a good role and create trust for the people, the district veterinarian can deliver medicine to the public, can advise how to use it, can teach the public how to inject, and the people can take care of their own animals in large part based on the transfer of the knowledge of the district veterinarian; It was also found that the agricultural stores in the district can help the people in solving the problem of animal treatment in part. They can send medicine to advise how to use medicine and recommend the right type of medicine for the animal disease that is happening

to the people. Another unit that can help is the online medicine sales service that also works to send prescriptions to the district veterinarian to the agricultural stores in the district and to the people who raise their own animals so that medicine can reach the point of need comfortably.

- But in the event of a serious disease outbreak, the organization at all levels, from the central province and the district, are focused on solving it urgently, especially at the central level: the Department of Livestock and Fisheries has brought specialized technical staff to coordinate with the Provincial of Agriculture and Forestry and all related parties at the province to coordinate with the district to go to the village and the place where have has the outbreak occurred as soon as possible.
- It's possible to create a group of VAHWs at village cluster which included five to eight possible villages. This can be easy for providers to provide quality of drugs, equipment and training.

In conclusion, it can be observed that the village veterinarians have specific technical limitations such as access to information about animal diseases, because the villages are located in remote areas. Some medicine' labels can't be read because of label in foreigner languages, (English, Vietnamese and Thai). In addition, the knowledge and ability to diagnosis, treatment and provide service still need to be trained. Limitation access to vet medicines' information is common seen.

For now, the main job of the village veterinarian is: animal treatment service when the animal has health problems. The owner of the animal is the one who calls and collects information about the animal in the village and sends it to the district veterinarian when there is a need for information from the upper level of the veterinary unit, but it appears that the system is not as clear as it should be.

7.2 Recommendations:

In order to be ensure implementation of the program to control African swine fever, other swine diseases and other diseases that may occur in Lao PDR according to the overall goals of the project plan, the team would like to make the following recommendations:

- Improve the organizational system and network of veterinarians at each level to be better and stronger, especially at the provincial and district levels. It can be done by adding more young people based on the selection criteria. Finding enthusiastic person is important. Update the capacity on specific areas such as disease surveillance, reporting, while providing equipment for communication, data collection system and other necessary are possible solutions. Therefore, we should decide to help them as soon as possible, especially to create village vets in villages that do VAHW yet. For villages that already exist, finding young personnel by selecting those who are suitable and truly passionate about this duty then capacity building and support the necessary equipment and fund can be another notion.
- Regular monitoring and support VAHWs by DAFO also important to be considered.

8. Acknowledgements

Thank you for the cooperation of each party at the provincial, district and village levels who have given time to provide information, especially the district veterinarian who followed the team and helped coordination with villages well. The district leadership who welcomed and gave advice to the team. Thanks to AVSF-Laos proving our team the opportunity to participate in the research and analysis of the ability of village veterinarians in the target villages of the project, which made us find the reality of veterinarians in remote communities that are convenient, difficult, risky and important to society.