

# Epidemiology and Control of Peste des Petits Ruminants (ECo-PPR)

## Field Researcher Manual

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Image: Sheep market in Doyogena, ILRI Flickr



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## Table of Contents

<b>Table of Contents</b> .....	<b>3</b>
<b>Introduction to the ECo-PPR project</b> .....	<b>5</b>
Box 1: <i>About the manual</i> .....	5
<b>Informed consent</b> .....	<b>8</b>
<b>Field researcher guidelines</b> .....	<b>9</b>
Box 2: <i>Open Data Kit (ODK)</i> .....	9
Box 3: <i>Field notebooks</i> .....	9
<b>Tools</b> .....	<b>11</b>
<b>1. Key informant interviews with veterinarians</b> .....	<b>11</b>
Box 4: <i>Best practices for recording qualitative data</i> .....	11
<b>2. Community meeting</b> .....	<b>13</b>
<b>3. Household survey</b> .....	<b>16</b>
Box 5: <i>Signing consent forms on behalf of respondents</i> .....	17
Figure 1. Household survey sections.....	19
<b>4. Flock examination</b> .....	<b>21</b>
<b>5. Participatory disease surveillance (PDS)</b> .....	<b>24</b>
Box 6: <i>Case definition for cases of PPR-like illness</i> .....	25
<b>6. Outbreak investigation, sample collection, and post mortem examination</b> .....	<b>29</b>
Table 1: Samples to be collected from suspected PPR cases in sheep and goats.....	32
Table 2. Samples to be collected from post mortem examination.....	33
<b>7. Market survey</b> .....	<b>35</b>
Table 3. Number of interviews by market size .....	36
<b>8. Flock dynamics</b> .....	<b>40</b>
<b>Annexes</b> .....	<b>42</b>
<b>Annex 1. Informed consent form</b> .....	<b>42</b>
<b>Annex 2. HH survey informed consent form</b> .....	<b>44</b>
<b>Annex 3: Viewing tools within ODK</b> .....	<b>46</b>
<b>Annex 4. Key informant interview with veterinarians guide</b> .....	<b>50</b>
<b>Annex 5. Community meeting tool</b> .....	<b>57</b>
List of participants .....	75
Livestock species ranking cards.....	76
<b>Annex 6: Community meeting – instructions for PRA tools</b> .....	<b>82</b>
Methods for simple ranking.....	83
<b>Annex 7: PDS Key informant interview guide</b> .....	<b>88</b>
<b>Annex 8: PDS Community meeting tool</b> .....	<b>91</b>
<b>Annex 9: Instructions for the PPRV rapid diagnostic test</b> .....	<b>96</b>
<b>Annex 10: Outbreak investigation form with clinical examination table</b> .....	<b>101</b>
<b>Annex 11. Estimating age by dentition</b> .....	<b>107</b>
<b>Annex 12: Market survey A - Key informant interview</b> .....	<b>108</b>

**Annex 13: Market survey B - Market observations.....111**  
**Information sheet 1: Key informant interviews.....112**  
**Information sheet 2: Community meeting .....113**  
**Information sheet 3: Household survey .....114**  
**Information Sheet 4: Market survey A - Key informant interview  
115**  
**Information Sheet 5: Market survey C - Questionnaire with buyers  
and sellers .....116**  
**Information sheet 6: PDS/Outbreak investigation .....117**  
**Information sheet 7: Flock dynamics.....119**

# Introduction to the ECo-PPR project

## Box 1: *About the manual*

This manual is to help you understand the goals of the project, the research tools, and your role as a researcher. You can take notes in your copy during the training and use it as a reference when you are working in the field. The manual covers many types of research activities, but you may be responsible for only some of the activities. The document contains hyperlinks, so is best viewed digitally, but you can print information you need for reference.

## Purpose

The purpose of this project is to provide research support to ongoing peste des petits ruminants (PPR) control and eradication efforts in East and West Africa. ECo-PPR stands for the eradication and control of PPR. PPR is a viral disease that affects small ruminants. Small ruminants are often important assets for livestock keepers in developing countries, but these assets are threatened by PPR. The PPR global control and eradication strategy has been endorsed by more than 200 countries with the vision of a PPR-free world by 2030. The project will generate evidence to support surveillance and control actions in selected countries with emphasis on high risk areas that are difficult to reach with vaccination campaigns and may become pockets of infection. An interdisciplinary approach will be used to understand the socioeconomic impact of PPR and gender sensitive challenges and opportunities for control. This guideline is targeted for training researchers and field data collectors in respective countries.

More information about the project can be found here:

- [Project profile](#)
- [Epidemiology and control of peste des petits ruminants in East and West Africa](#)
- [Study design and toolbox](#) on CG Space
- ECo-PPR Youtube Channel
- [Inception workshop for West Africa](#)

## Location

ECo-PPR will conduct research in six countries in East and West Africa: Kenya, Tanzania, Ethiopia, Senegal, Mali, and Burkina Faso.

## Duration

2019–2022

## Donor

This project is funded by the European Commission through the International Fund for Agricultural Development (IFAD). It is implemented by the International Livestock Research Institute (ILRI).

## Outputs

The project has four outputs.

- Generate evidence on disease epidemiology, social networks, and gendered disease impact.
- Develop frameworks to assess disease risk and feasibility of eradication under different control scenarios in remote high-risk areas.
- Validate and test vaccines and gender sensitive vaccine delivery models for specific epidemiological and geographical situations.
- Improve surveillance capacity and coordination at national and regional levels.

## Tools

The project "toolbox" consists of a set of research activities that will be conducted in each country.

- **Desk review:** Gathering published literature on PPR epidemiology, impacts and vaccine delivery.
- **Key informant interview:** Discussion with district/ regional veterinarians to understand small ruminant diseases, animal health services, animal movement, location of markets, and key organizations / stakeholders in the area.
- **Community meeting:** Meeting of 15-25 livestock keepers to understand the main disease problems, animal movement, role of different family members in production activities, and approaches to disease prevention and control with a focus on PPR.
- **Household survey:** Administered to a man and woman in each household (when possible) to understand PPR epidemiology, flock movement, socioeconomic impact of disease, and responsibilities and decision-making in small ruminant production between household members.
- **Flock examination:** Administered with the household survey to understand flock composition and identify current disease problems using a quick clinical examination.
- **Participatory disease surveillance:** based on information collected during key informant interviews, community meetings and other data collection, identifying places where PPR is likely to be occurring and conducting active surveillance in these places (using key informant interviews, group meetings, flock visits).
- **Outbreak investigation:** Data collection on clinical signs, mortality and production losses, and risk factors during a disease outbreak.
- **Sample collection:** Collection of samples from suspected PPR outbreaks.
- **Post-mortem examination:** Conducted when possible to help establish a diagnosis of PPR or other diseases.
- **Market survey:** Interviews with individuals who are buying and/or selling sheep and/or goats in live animal markets to understand trading practices and market networks.

- **Flock dynamics:** Longitudinal survey with a subset of households to understand how flock composition changes over time (birth, death, sale, etc.) and to identify disease events.
- **Qualitative socioeconomic and gender studies:** Informed by household survey results, focus group discussions and key informant interviews will be conducted to learn more about the socioeconomic impact of disease on households and individuals and to identify gender sensitive barriers and opportunities for disease control.

Some research activities may be targeted to the specific needs of individual countries.

- **Willingness to pay/ choice experiments:** Activities done with households or individuals to learn about their preferences for different vaccine traits and/ or delivery systems.
- **KAP surveys:** This activity will target vaccinators and will assess their perception, knowledge attitude and practices towards PPR vaccine and vaccination.

Notes:

## Informed consent

Informed consent means the interviewee understands the activity and voluntarily decides to participate. Before participating in each research activity, we must obtain informed consent from an adult at least 18 years old.

First, the researcher will read the project information sheet aloud. This is to explain to the interviewee the objectives of the activity and lay out potential risks and sensitive information and how they will be handled. The researcher will also explain the benefits of participating in the activity and give contacts of the research team for further follow up.

Second, the researcher will ask for verbal or written consent. Refer to the consent process for each activity to know which is required. Verbal consent will be sought for group meetings and key informant interviews, while written consent will be sought for individual surveys.

Without consent from an adult at least 18 years of age, we must not continue the activity. A person may decide not to continue giving consent during an activity. It is also possible to give consent for only some activities, such as consenting to the household survey, but not the flock examination. If a person decides not to participate, politely thank them for their time and end the activity.

There are two consent forms for this project, found in Annex 1 and 2. The [informed consent form \(Annex 1\)](#) is used for all activities except the household survey, which uses the modified [HH survey consent form \(Annex 2\)](#).

Notes:

## Field researcher guidelines

These are some common guidelines that apply to all research activities.

- Obtain information about the “dos” and “don’ts” in your study area or community to avoid breaching important social norms.
- Be friendly and polite to encourage trust and be truthful about research activities. You are representing the research project and the partners working with the project.
- Record data as completely as possible. If the form does not allow you to enter something that you think is important, add it in a notes section or record in your field notebook and tell your field lead at the end of the day. Never forge data.
- Only people who have been selected by the project should participate. There are strict rules about how people or households are selected, especially for activities such as the market survey or household survey. If someone is curious about the project and/ or asks to participate, you can share with them what the project is about but explain that only some people in the community have been selected to participate.
- Report any problems to the field lead. This could include security or safety issues, challenges with data entry, or research activities that seem to be difficult for participants or seem to be giving poor quality data.

### **Box 2: Open Data Kit (ODK)**

Most project activities use ODK software to collect data electronically using tablets. It is more efficient than using paper forms and makes data analysis easier, but the format can be less flexible for data entry and tablets require more care. It is your responsibility to keep the tablet charged and functional, and report to the field lead if you have additional information from a research activity that isn’t recorded electronically.

See [Annex 3: Viewing tools within ODK](#) for additional instructions.

### **Box 3: Field notebooks**

We will not create paper backups of research activities, but researchers are expected to keep a field notebook and later give them to the team lead. This is a place to briefly record your activities each day, note additional information that is not captured electronically, or note problems/ questions for the field lead. It can be used as a reference in case of any questions about electronic data. For some qualitative activities such as community meetings, you will take paper notes and enter them using an online form later.

Notes:

## Tools

### 1. Key informant interviews with veterinarians

This is a semi-structured interview that is conducted with district/region or area vets. You will have a list of questions to guide you, but the questions are flexible, so you can change the order of questions and ask probing questions during the interview depending on how the key informant responds. The objectives of the interview are to gain an understanding from the vets about the main small ruminant diseases, the available resources, the location of markets, and key organisations and stakeholders in the area.

#### Format

Take notes during the interview using best practices for recording qualitative data (see Box 4). If you are working in a team, one person can lead the discussion while the second person takes notes. You will later type up the notes into an online form. Audio recording should be used as a back-up if possible.

Refer to [Annex 4: Key informant interview with veterinarians tool](#)

#### Box 4: *Best practices for recording qualitative data*

- Make notes that capture as much detail as possible of what the person is saying, to reflect their “voice”. You may have to make short notes to keep up with what the person is saying, so use abbreviations. Check through your notes as soon as possible after the interview to make sure you can understand them. Make corrections and add anything that has been missed.
- Capture memorable quotations  
“Sheep are like fast growing cabbage.”
- Note emotion and tone of voice  
(She said angrily...)
- Capture disagreements and discussions if there are multiple people  
(Others nodded in agreement, but one man said...)
- Take note of the environment and setting for context  
(Meeting took place outside and there were some distractions)
- Include relevant demographic details about the speaker such as approximate age, gender, occupation, marital status.  
(Young woman in 30’s, married, training as animal health worker)

#### Participants

One or more district/region or area vets as required to obtain an overview of the area. These will be interviewed individually or as a group, whichever is easiest and produces the necessary information.

#### Duration

The interview should last around 30 mins to 1 hour.

### **Informed consent**

Written consent is preferred but verbal consent is also acceptable. Ask for consent to use an audio recorder (if using), but if the vet prefers not to be recorded it is not a requirement.

### **Steps**

1. Arrange for an appointment with the participant(s) at a place of his/her choice
2. Introduce yourself and the team
3. Let the participant(s) introduce themselves
4. Setting the scene: Introduce the organizations involved and the project, highlighting the objectives of the project and the important role of the participants in meeting the objectives of the interview (see [Information sheet 1: Key informant interviews](#)).
5. Take them through the planned process of the interview.
6. Obtain informed consent by reading the project information sheet and getting written or verbal agreement.
7. Start the discussion on the themes listed in the interview guide. Probe as much as possible to get the required information.

### **Materials needed**

- [Key informant interview with veterinarians guide \(Annex 4\)](#)
- [Consent form](#) and [Information sheet 1: Key informant interviews](#)
- Audio recorder (if using)
- Notebook and pen

Notes:

## 2. Community meeting

The aim is to understand the role of livestock keepers in the livestock value chain, the small ruminant production system, movement of small ruminants, the main disease problems of small ruminants, and approaches to disease prevention and control with a focus on PPR.

### Format

This is a participatory meeting that is guided by the facilitator using the list of topics in the meeting guide to encourage all the participants to share and discuss their knowledge and experiences. This is one of a few tools that is not administered digitally with ODK. A note-taker will take notes of the discussions during the meeting and type them for entry into a Word document later. The format is less structured than other activities leaving the research team with some freedom to add relevant questions in response to participants' responses if needed.

Refer to [Annex 5: Community meeting tool](#) and [Annex 6: Community meeting tool – instructions for PRA tools](#)

### Participants

One or more meetings per study area (depending on the size of the area) will be organized. The group of participants will be made up of 15 to 25 people purposively identified. Participants should understand the small ruminant production system in the area. It is important that the views of both men and women are heard, either through a combined meeting of men and women that is facilitated to ensure that both men and women have the opportunity to contribute, or if this is not possible, then separate meetings should be held with women and with men. If dividing into men and women, start the meeting with everyone present and then divide into men and women after the introduction and obtaining consent. The groups can be brought back together for the final part of the meeting and the closing. The choice of combined or separate meetings depends on what is most appropriate for the study site. If men and women are together, conduct livestock species ranking and disease ranking separately. To make this easier, encourage a circular seating arrangement where men are together on one side and women are together on another side.

Criteria for selecting: the participants should be part of the following groups

- Small ruminant livestock keepers, livestock owners, and/or herders (men and women),
- Members of farmers' cooperatives for sheep and goat keeping.

### Duration

The community meeting should last no more than 3 hours.

## **Informed consent**

Verbal consent after the facilitator goes over the information sheet.

## **Field team roles**

- Facilitator – Reads the questions and manages group dynamics. The facilitator may encourage quiet participants to speak or manage very active participants. They will introduce the activities, distribute necessary supplies, and be the voice of the project.
- Note-taker(s) – Responsible for taking notes. This person should not be doing other tasks such as helping with activities or translating. If possible, it can be helpful to have two people each taking separate copies of notes for comparison later. See [Box 4. Best practices for recording qualitative data.](#)
- Translator – If needed, a translator. As well as translating the main discussion, encourage this person to also translate side conversations and interactions between participants if possible. It is important that this person translates what the participants are saying and should *not* answer on behalf of the focus group participants even if he or she is from the area.

## **Steps**

1. Visit the area to introduce the project to the key local leaders such as area vets, community leaders and administrative officials. At the same time identify participants for the meeting and fix a meeting date.
2. Arrange for a quiet place for the meeting with limited disturbance (avoid areas by the road site, market or public places).
3. Raise a budget to carry for the small expenditures such as drinks and snacks.
4. Welcome the participants and have one of them open with a word of prayer (or whatever is appropriate in your setting).
5. Introduce yourself and the team.
6. Have the participants introduce themselves.
7. Set the scene by reading the project [information sheet.](#)
8. Obtain verbal consent (including for audio-recording if applicable).
9. Start the discussion on the themes listed in the community meeting tool. Probe as much as possible to get the required information but avoid leading questions.
10. The discussions will be recorded by a note-taker in the research team, either in a notebook or on a record form as preferred. The audio recording will serve as a back-up to the notes taken during the meeting.

**Materials:**

- [Community meeting tool \(Annex 5\)](#) and [instructions for PRA tools \(Annex 6\)](#)
- [Information sheet 2: Community meeting](#)
- Audio recorder
- Flip chart paper
- Counters
- Coloured marker pens
- Community meeting record form ([Annex 5](#))
- [Livestock species ranking cards](#) (2 sets for men and women) in Annex 5
- Notebook and pen

Notes:

### 3. Household survey

The tool aims to collect data on sheep and goat husbandry, flock movements, reproduction, diseases, disease prevention, impact of disease, formal and informal trade, and responsibilities and decision-making. Intra-household data will be used to understand differences in disease identification, disease prevention, and responsibilities and decision-making for small ruminants between men and women.

#### Format

The household survey is programmed for electronic administration by tablet. See [Box 2. Open Data Kit \(ODK\)](#) and [Annex 3: Viewing tools within ODK](#). Researchers will work in pairs of one man and one woman so they can administer the questionnaire to men and women in the household. The questionnaire administered to men and women is identical, but for ease of data management, they will be labelled differently as 'Male survey' and 'Female survey'.

In addition to the primary man and woman, other household members present are encouraged to contribute to answering questions with their respective gender group. If a flock is being looked after by a herder (not a family member), then ideally the herder should participate.

#### Participants

Before the survey starts, a random selection of 150 households will be made per study site, to give a total of 750 households from the five study sites in each country. In each study site, draw up a list of villages in the area, assign each village a number, and then use random numbers to select 15 villages to be sampled. In each village, draw up a list of households, and then use random numbers to select 10 households from each village.

An eligible household has a consenting adult over 18 years of age and has owned at least one sheep or goat within the past six months. Our goal is to interview a man and a woman from each household.

A **household** is a group of people who live together and take food from the "same pot." For example, if a man has two wives and each wife cooks separately for herself and her children, then they are considered two separate households. In this case, you can select the first wife's household to interview, or one household of any of the wives. In other surveys you may be familiar with, a single person, usually the head of household, represents the household by answering questions. In this research, it is important to explore the roles, perceptions, and knowledge of men and women within the same household. For this reason, we want to interview two respondents from each household whenever possible.

The **male and female respondents** are the men and women who self-identify as the primary people responsible for the decision making, both social and economic, within the household. They are usually husband and wife, but any household member over 18 years can be a respondent. For example, you may interview a grandmother and her grandson who is over 18 but not yet married. Some households may have only a female respondent if there is no adult male present in the household. Please discuss any questions with your supervisor.

### **Duration**

The interview should take approximately 30 - 40 minutes depending on the level of interest of the household members.

### **Consent**

Written consent is preferred. Verbal consent is acceptable but must be documented by the researcher on a paper consent form (Box 5). If a man and a woman from a single household are both interviewed, both will need to give consent separately. The [HH survey informed consent form](#) has sections for two interviewees.

Best practice is to obtain consent from the head of household before interviewing any member of the household. If a head of household is nearby but not at home, it is a good idea to try to call the person and ask if another household member can continue or if there is another time that would work better. Use your best judgement.

### **Box 5: Signing consent forms on behalf of respondents**

If the consent form is required for an activity and a respondent verbally agrees but is not able to sign the consent form, a researcher can sign on behalf of the respondent. This should be noted on the form.

Signature of enumerator (*if signing on behalf of interviewee*): *Signature*

### **Steps**

#### **Sample introduction**

[This is a sample introduction that can be used in addition to the written consent form to help explain the project.]

“Good morning/afternoon. We are coming from [PARTNER ORGANIZATION’S NAME]. We are conducting a survey to understand sheep and goat diseases, movement of sheep and goats in your household, and perspectives from different household members about keeping sheep and goats. There are no right or wrong answers, we are interested in hearing the opinions of different members of the household because different family members have different roles. We would like to share some of this information widely so that more people understand

about sheep and goat diseases, how they spread, and the role of different family members in raising sheep and goats.

[IF INTERVIEWING A COUPLE]: This survey has two parts. In the first part, we would like to interview the principal couple in the household together; this part will take approximately ten minutes. In the second part, we would like to interview men and women separately; this part will take about thirty minutes.

### **At the interview**

1. Introduce yourself and the team.
2. Have the participants introduce themselves.
3. Setting the scene: Introduce the project by reading the project [information sheet](#).
4. Obtain written signed consent (or verbal consent if written consent is a barrier to participation with researcher documenting this on the consent form).
5. On arrival at the household to conduct the household interview, first check whether the flock or flocks belonging to the household are present. If the flock is available, then decide whether it is best to examine the flock before or after the interview, depending on whether the flock will go for grazing or watering and not be available later.
6. Identify whether the household has a man and a woman involved with sheep and goats. This will help the researchers decide whether to use the Male Survey, the Female Survey, or both. Remember, the questionnaires are identical, but are labelled differently so we can keep track of which questionnaires have been filled.
7. Start the interview with all participants present. Both researchers will complete section A on their tablets. Section A contains basic information to match the respondent to the household. Section B and C can be filled by only one of the researchers on behalf of the household. (See [Fig. 1: Household survey sections](#)) When prompted, divide the group into men and women, and continue the interview separately with each.
8. Conduct the flock examination if you haven't already. If flock is not present and you are not able to easily come back, record the telephone number of the HH head for follow up by calling.
9. At the end of the interview, bring the two groups back together and thank them for their time. Distribute a small present (such as dewormers, TBD depending on study site) at this time.

### **Follow-up interviews**

10. Sometimes, one of the household decision-makers may not be present during the first visit to the household. When this happens, interview the decision-maker you find using the

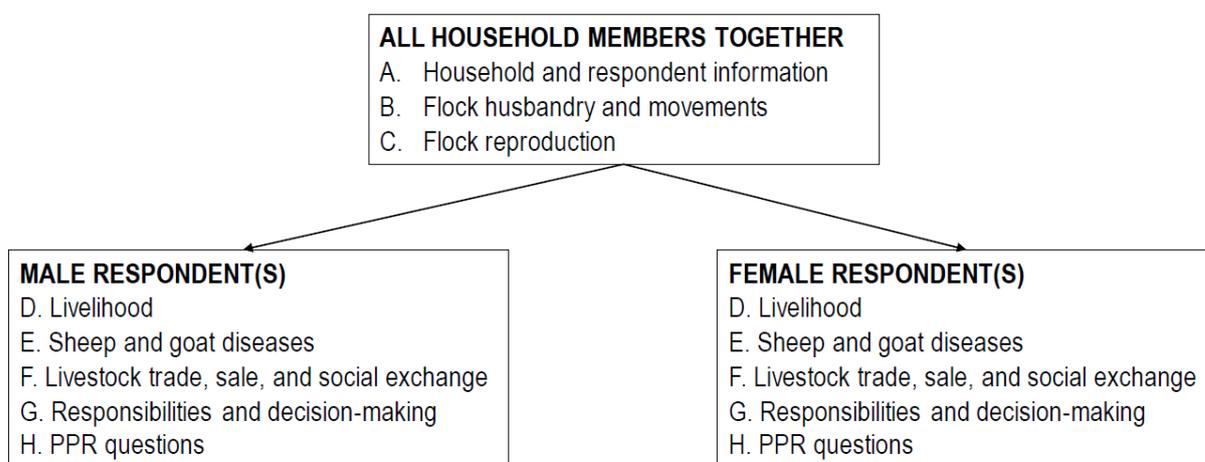
appropriate questionnaire. If the absent decision-maker may be available later in the day or the next day, make a plan to meet with him/ her. Collect phone numbers to assist. It is also okay to interview someone at another location, such as at a business or on the farm, if appropriate. The goal is to have paired questionnaires (male and female) for as many households as possible.

## Materials

- Tablets programmed with digital survey using ODK
- [HH survey consent form](#) and [Information sheet 3: Household survey](#)
- Notebook and pen for researchers to note additional information about households, request changes to entered data post-submission, etc.

## Personnel

Two researchers will visit each household the first time, ideally a man and a woman. A single researcher may make a subsequent visit alone to complete the Female or Male Survey if arrangements were made to return during the first visit. Researchers must speak the local languages.



## Figure 1. Household survey sections

*In ODK, you will find a male and a female survey. The surveys are the same (they both have sections A-H) but are labeled so it is easy for the research team to check that each household has the necessary surveys. If two researchers are both interviewing members of the same household at the same time, sections B and C only need to be collected on one tablet. There is an option for one enumerator to skip sections B and C programmed in the digital survey.*

## Household Survey: General Instructions for All Sections

- Do not read out the list of coded answers to the respondents unless explicitly instructed.
- If possible, and as facilitated by field team composition, male interviewers should interview the primary male respondent and female interviewers the primary female respondent.
- Sections A, B, and C are identical and will be completed together with male and female respondents. Both interviewers will record the information from these sections into their tablets. After section C, the questionnaire will ask for you to split the groups. At this time, the woman will continue with the female interviewer and the man will continue with the male interviewer. If other household members are present, they can join the appropriate group.
- If two researchers are interviewing a man and a woman at the same time, one of the researchers can choose to skip sections B and C on their tablet. The surveys will be paired later using the household ID.
- It is ok for other household members to assist with the recall for questions asked of the entire household in sections A-C. It is ok for same sex household members to assist the primary respondent with recall for questions in the remainder of the survey, sections D-H.
- It is NOT okay for men and women to ask for recall assistance from each other in the second portion of the survey, sections D-H. It is okay if the respondent doesn't know the answer – you can indicate this in the survey.
- Although the research design focuses on gender, it is best to downplay this so as not to skew or bias results. You can tell the respondents that you are interested in the perspectives and roles of different household members in sheep and goat production. If asked directly, it is okay to mention that some of the research focuses on gender.

## Household Survey: Instructions by Section

- **Household ID** – Make sure the household ID is identical for the male and female surveys from the same household.
- **Enumerator/ researcher name** – Only complete surveys using your own name and password.
- **A1** – Use a legal name of surname and family name.
- **A6** – Best for researcher to answer without reading the question directly using information he/ she learns during introductions. This is

a screening question so we know whether both the female and male surveys should be completed for the household.

- **Option to skip section B and C** – A household with a man and women both present will also have two researchers with two tablets. Sections B and C are for the household overall so the information doesn't need to be collected twice. This skip allows two researchers to choose between themselves – one person will enter the responses into their tablet and the other person will choose to skip. The instructions in ODK read: "Please choose the best option. - Collect information for section B and C on this tablet OR skip to section D because the other researcher will collect on their tablet."
- **B1** - A flock is a group of animals that stay in the same place at night and are herded together during the day.
- **D2-3** - Do not read responses. Select the responses that best fit the answer. Prompt for up to three main reasons (Is there anything else?)
- **E1** – For the disease name, write exactly what the respondent tells you. Do not translate into another language or try to guess what the disease may be based on clinical signs, although additional information, such as the literal translation of the name, or a major clinical sign, can be added in brackets if this is given by the respondent.
- **E2-E3** – These questions may remain open-ended for piloting. Be as detailed as possible.
- **E4** – If the month is not known, select the correct year and use January as a default.
- **Section F** – Give as much information as possible when describing location including names of markets, villages, towns, or other useful landmarks
- **F11-12** – It is okay to give examples of social reasons for giving or receiving animals if the respondent does not understand the question right away.
- **Section G** – Do not read the responses, and make sure to ask each question, even if you already know the response for a similar activity. Specify in the notes section if the person mentioned is not a family member by writing "veterinarian" or "employee".
- **H1** – Even if the respondent knows very little about PPR or has never personally had the disease in their flock, select "yes". Prompt again before answering "no" as it will skip subsequent questions.
- **Closing** – It is important to reunite the two groups and spend a few minutes answering any questions they may have together.

#### 4. Flock examination

The aim of the flock examination is to complement the household interview with data on the flock size and composition (species, age) and to see if there are currently any disease problems in the flock.

On arrival at the household to conduct the household interview, first check whether the flock or flocks belonging to the household are present. If the flock is available, then decide whether it is best to examine the flock before or after the interview, depending on whether the flock will go for grazing or watering and not be available later. The flock examination and the household survey are separate forms in ODK so they can be completed in any order.

If the flock is not present at all during the time of the interview, you can complete the tool anyway by speaking with the livestock keeper, but you will note within the ODK form that the flock was not examined. If possible, record the telephone number of the HH head for follow up by calling.

### **Format**

This tool is administered digitally using tablets programmed with ODK. See [Box 2: Open Data Kit \(ODK\)](#).

### **Informed consent**

Any adult respondent from the household survey can be asked the flock examination questions. There is a place on the household survey consent form to also give consent for the flock examination. It is okay for someone to give consent for some but not all activities.

### **Steps**

1. Request to have a look at the flock to see the condition of the animals.
2. Observe the flock as a whole to see the general condition of the animals and whether there are any obvious signs of disease.
3. While looking at the flock, do a rough estimate of flock size and composition – but do not openly count the animals because this is not acceptable in many cultures. If the flock size is small, you can quickly count the number of sheep and number of goats, then check how many are adults, how many are lambs and kids (less than 6 months old) and how many are immature (6-12 months old). For larger flocks, the best method is to count 20 animals, then with that group in mind, estimate how many more groups of 20 there are in the flock. Then roughly assess what proportion are sheep and what proportion are goats – from the estimate of the flock size you can then calculate the number of sheep and the number of goats. Then observe what proportion are adult, immature and young, so you can calculate the approximate numbers in each category.
4. If you observe sick animals, or the livestock keeper shows you sick animals, do a quick clinical examination and record the main clinical signs, and the number and type of animals affected. Ask if any animals have died from this disease. Ask the livestock keeper the name of the disease problem in the local language.
5. Using the PPR case definition (Box 6), assess whether this could be a possible case of PPR that needs to be followed up – see [Section 6](#):

[Outbreak investigation, sample collection, and post mortem examination.](#)

6. If you are not able to see the flock, ask for the approximate numbers of animals in each age category for each species (if culturally appropriate in the study site). Also, ask if the flock has any current disease problems, and fill in the details of disease name, clinical signs, number and types of animals affected, number died in the ODK form. You will indicate on the form that the information was reported rather than observed.

Finally, check if the flock you are looking at is the only flock, or whether there are other flocks elsewhere that belong to the household. If there are one or more other flocks that are not present, ask for the approximate size of the flock for each age category for each species (if culturally appropriate in the study site). Also ask whether there are any current disease problems, and if there are, collect the details as shown in the ODK form.

**Follow-up in case of possible PPR**

If you have observed the flock and have found what looks like possible PPR disease, an outbreak investigation, clinical examination, PPR rapid test and sample collection should be carried out. If you are a veterinarian and have been trained in these procedures, you can carry this out at the time of the household interview visit. Otherwise, you should report the suspected PPR case to the field lead and a trained member of the team will follow up. Let the livestock keeper know that someone from the team will return, obtain their mobile phone number, and ask about a good time to come back.

Notes:

## 5. Participatory disease surveillance (PDS)

The aim of PDS is to determine whether PPR disease is present in the study area, and to describe the history and pattern of PPR disease occurrence in the area.

Participatory disease surveillance (PDS) is a method of disease surveillance that uses participatory approaches and methods together with conventional disease investigation methods, to explore local veterinary knowledge and to identify the pattern of occurrence of a particular disease in an area.

### Format

PDS contains multiple activities, each with its own format

- **Key informant interviews:** A note-taker will take notes of the discussions during the meeting and type them for entry into an online form later.
- **Community meeting:** A note-taker will take notes of the discussions during the meeting and type them for entry into an online form later. The format is less structured than other activities leaving the research team with some freedom to add relevant questions in response to participants' responses if needed.
- **Outbreak investigation:** A digital form programmed in ODK along with other activities such as sample collection. See section [6: Outbreak investigation, sample collection, and post mortem examination](#).

### Method

The baseline studies of the ECo-PPR project are the first stage of the PDS:

- The desk review and key informant interviews provide background information on the small ruminant population, small ruminant disease situation, and control activities.
- The community meetings and household interviews provide information on small ruminant movements and trade, the main disease problems and control activities.

During these baseline studies, any mention of PPR-like disease should be noted, and further questions asked to find out where and when it occurred.

If it is a current disease problem, then an outbreak investigation should be carried out, and rapid diagnostic tests and samples collected for laboratory analysis if PPR-like disease is found (See section [6: Outbreak investigation, sample collection, and post mortem examination](#)).

When making decisions about whether a disease report or observed disease problem is a potential case of PPR, we can use a case definition to guide us (Box 6).

PPR-like disease or Pneumo-enteritis syndrome is defined as:

A flock of small ruminants that have several sick animals showing some or all of the following clinical signs:

- Bilateral nasal discharge
- Fever
- Coughing and/or diarrhoea
- With or without
  - Bilateral lacrimation and/or conjunctivitis
  - Sneezing
  - Dyspnoea (difficulty breathing)
  - Mouth erosions
  - Death

**Box 6: Case definition for cases of PPR-like illness**

Having completed the baseline studies, the research team will have started to build up a picture of where and when PPR disease is likely to occur within the study area. High risk locations should be identified and purposively targeted for the next stage of PDS. These are areas with:

- Recent reports of suspected or confirmed PPR disease,
- Previous history of suspected or confirmed PPR disease,
- Areas with an unknown disease situation due to limited disease reporting, limited animal health service, poor access or remoteness,
- Areas where many small ruminants congregate (e.g. seasonal grazing areas, watering points),
- Areas at risk due to small ruminant movements e.g. major livestock markets, trade routes, migration routes.

In each high-risk area, the following activities are carried out:

- Key informant interviews – see Annex 7: PDS Key informant interview guide
- Community meetings with livestock keepers – see Annex 8: PDS Community meeting tool

- Household visits for outbreak investigation, rapid diagnostic test and sample collection – see section [6: Outbreak investigation, sample collection, and post mortem examination](#).

These are very similar to the baseline study methods, but more focussed on PPR disease.

### **Field team roles**

The field team should be composed of 2-3 people including a researcher, a veterinarian (or experienced para-veterinarian), someone who can speak the local language, and someone from the local area. For example, the team could be two people – a researcher who is a veterinarian and a local animal health worker who speaks the local language and knows the area.

### **Participants**

The key informant interviews should be conducted with local leaders and the local veterinarian or para-vet.

For the community or village meeting, gather together a group of livestock keepers from the village or part of village in a local meeting place.

### **Duration**

The key informant interview will take 15-20 minutes, and the community meeting will take about 1 hour.

### **Informed consent**

Information about the project should be provided to all participants in PDS, whether key informants or livestock keepers, and their consent to participate should be obtained, either in writing or verbally, as appropriate.

### **Information sheet: Key informant interviews (PDS)**

See [Information sheet 1: Key informant interviews](#).

### **Steps**

#### **Preparation**

Contact the local leaders and/or local veterinarian/para-vet to arrange a time to interview them as key informants, and let them know that you would like to visit places that might have a disease problem to meet with the livestock keepers and to investigate any disease problems that are discovered during the visit.

## **Implementation**

The key informant interview is carried out first, to explain the purpose of the PDS, which is to understand the main disease problems in the area, and to obtain their consent to conduct surveillance in the area. Do not specifically mention PPR at this stage because it will bias their answers to your interview questions. Follow the topics on the key informant checklist. Based on the information from this interview, identify places to visit that are high PPR risk and arrange to visit them to conduct community meetings. If appropriate the key informant may accompany the team, to assist with bringing people together for the community meeting, and to take the team to households that have possible cases of PPR.

Having gathered together a group of livestock keepers in a suitable meeting place, introduce the field team and explain that you have come to discuss small ruminant disease problems (don't specifically mention PPR at this stage). Explain that the project is aiming to better understand small ruminant diseases, in order to improve surveillance and control of those diseases. Allow the participants to introduce themselves. Follow the topics on the [PDS Community meeting tool in Annex 8](#).

## **Follow up**

If a disease with PPR-like signs is mentioned during the key informant interview or community meeting, find out which flocks are affected and make a plan to visit them to conduct outbreak investigations, rapid test and sample collection. See section [6: Outbreak investigation, sample collection, and post mortem examination](#).

If no PPR-like disease cases are described, ask to visit 2-3 flocks with other disease problems. Conduct outbreak investigations and flock examinations in these flocks to ensure that there is no PPR-like disease and provide appropriate advice for the diseases that you see. This demonstrates interest in their livestock and their problems, as well as building up our understanding of other diseases in the area.

If no current PPR-like disease is described or identified during the visit, try to find out if they have heard of PPR-like disease occurring in neighbouring areas. If new areas are identified, then these are the next places to move to for PDS.

## Materials required

- Notebook and pen
- Tablet with ODK for outbreak investigation form or paper outbreak investigation form
- [PDS Key informant interview guide \(Annex 7\)](#) and [PDS Community meeting tool \(Annex 8\)](#)
- Information sheets [1. Key informant interviews](#) and [6. PDS/ outbreak investigation](#)
- [Consent form \(Annex 1. Informed consent form Annex 1\)](#)
- Audio recorder
- Flip chart paper, coloured marker pens
- Sampling kit
- Cool box with ice packs/liquid nitrogen tank
- PPRV rapid diagnostic test kit
- Camera
- Medicine kit

Notes:

## **6. Outbreak investigation, sample collection, and post mortem examination**

The aim of the outbreak investigation is to determine whether a disease problem in a flock is a case of PPR disease.

### **Format**

The outbreak investigation form can be completed within ODK or as a paper form. Additional activities may include include clinical examination, sample collection, post-mortem examination, and PPRV rapid diagnostic test.

### **Method**

The outbreak investigation includes an interview with the livestock keepers to gather epidemiological information about the disease problem, followed by a general examination of the flock and clinical examination of sick animals. If the disease problem is judged to fit the case definition for PPR-like disease (See [Box 6: Case definition for cases of PPR-like illness](#)) then samples are collected from 1-5 animals for PPRV rapid diagnostic test and for submission to the laboratory for PCR and sequencing. If there are any recently dead sheep or goats (within 24 hours) then a post mortem examination can also be carried out and tissue samples collected for laboratory submission.

### **Field team roles**

The field team should be composed of 2-3 people including a researcher, a veterinarian or experienced para-veterinarian, the local veterinarian or para-veterinarian, and someone who can speak the local language. For example, the team could be two people – a researcher and the local veterinarian who speaks the local language.

### **Participants**

The participants are the livestock keepers who look after the affected flock.

### **Duration**

30 minutes to 1 hour, depending whether animals are sampled and/or post mortemed, and how many are examined.

### **Informed consent**

Information about the project should be provided to the livestock keepers, and their consent to participate and allow sample collection from their animals should be obtained, either in writing or verbally, as appropriate.

## **Information sheet: Outbreak investigation, sample collection, post mortem examination**

Refer to [Information sheet 6: PDS/ Outbreak investigation](#)

### **Preparation**

Ensure the team is fully equipped to conduct the interview, as well as to examine and sample the flock and to conduct a post mortem examination if the opportunity arises. In order to examine the flock, it may be necessary to make the visit early in the morning, or in the evening, otherwise the flock may have been moved away from the household to go for grazing.

Read the instructions for the [PPRV rapid diagnostic test \(Annex 9\)](#) that are included in the test kit before going to the field so that you are familiar with the method.

### **Implementation**

Firstly, use the outbreak investigation form to guide your interview with the livestock keepers. Note that it is important to record the disease names as used by the livestock keeper in the local language, and also to ask for the literal meaning of the local names (if available).

Then examine the flock as a whole, initially from a distance, then move closer and walk among the animals to identify and separate individual sick animals for full clinical examination.

Examine each sick animal systematically from nose to tail, paying particular attention to the eyes, nose, mouth, lymph nodes, breathing, and signs of diarrhea. Take the rectal temperature. Record the clinical findings in the clinical examination table (See [Annex 10: Outbreak investigation form with clinical examination table](#)), giving each animal a unique ID number using the country code and a number (1-n, number the animals continuously from the first outbreak investigation onwards). For estimating the age of animals, check the dentition – how many pairs of permanent incisors are there? (See [Annex 11: Estimating age by dentition](#)). Also ask the owner for the age of the animal, this is useful for cross-checking with the dentition. Describe the clinical signs e.g. if there is watery lacrimation, then under ocular signs write “watery lacrimation”. If the eyes look normal, then write “OK” or “NAD” (no abnormality detected) under ocular signs.

If there are animals with PPR-like disease, then select up to 5 animals for the PPRV rapid diagnostic test. The best animals to test are those that have been sick for 1-3 days with a raised temperate ( $\geq 40.0^{\circ}\text{C}$ ) and early

signs of PPR disease; ocular and/or nasal discharge, with or without mouth lesions, coughing, sneezing and diarrhoea.

Following the PPRV rapid diagnostic test instructions carefully, collect a nasal swab from one animal at a time and run the test. Record the result on the clinical examination form. Note that you only need to find one positive animal to confirm that the flock is infected with PPRV, so as soon as a test is positive, there is no need to run any more rapid diagnostic tests. If you are short of time, you can run two tests at a time.

If you get a positive animal, then collect a full set of samples (see [Table 1: Samples to be collected from suspected PPR cases in sheep and goats](#)) from the positive animal and from 2-3 other animals with early PPR clinical signs for laboratory testing (eye and nose swabs, and a plain blood sample for serum).

If all the rapid diagnostic tests are negative, but the clinical signs and epidemiological information are strongly suspicious of PPR disease, then collect samples from six animals with early clinical signs for laboratory analysis.

Indicate on the [outbreak investigation form \(Annex 10\)](#) which samples have been collected from each animal. Label the samples with the animal ID number (country code and number), the type of sample (eye, nose, mouth) and the data of sampling.

For animals that are clinically examined but no samples are collected, write "ND" (not done) or put a line "-".

**Table 1: Samples to be collected from suspected PPR cases in sheep and goats**

	<i>Type of sample</i>	<i>quantity</i>	<i>Processing, field storage, transport to lab</i>	<i>Assay</i>
1	Clotted blood	1 x 10cc plain vacutainer (red top)	Allow to clot at room temperature for several hours or overnight. Centrifuge, pipette serum into 1.5 cc cryovials (at least 2 vials per animal). Store in -20°C freezer, transport in cool box on ice (or LN <sub>2</sub> if using)	Antibody assay - cELISA
2	Swabs	2 x conjunctival swab 2 x nasal swab 2 x oral swab	Put swabs into 6 individual cryovials. Store and transport in LN <sub>2</sub> (best option) OR store in -20°C freezer, transport in cool box on ice.	Real-time RT-PCR, positives for conventional RT-PCR, isolation and sequencing of positives
3	Any additional samples for differential diagnosis?			

During the outbreak investigation, enquire if there are any dead animals which could be necropsied, or if it might be possible to kill one or more severely ill animals for necropsy. Opportunities to conduct necropsies (post mortem examinations) should be seized on because the findings can be of great assistance in establishing a possible diagnosis of PPR or other diseases. Necropsies should be performed as soon after death as possible but characteristic signs can still be seen a day or more after death. Make a note of the findings in a notebook, and then enter the data into the data collection form after the post mortem. Collect tissue samples as detailed in [Table 2. Samples to be collected from post mortem examination.](#)

1. First examine the outside of the carcass for characteristic signs, looking systematically from nose to tail:
  - Eyes, nose, mouth, skin
  - Body condition
  - Soiling of hindquarters with diarrhoea
  - Check the feet for lesions of FMD or bluetongue
2. Open the chest and inspect the thoracic organs in situ:
  - a. Lungs, heart – check for fluid, adhesions, discoloration
  - b. Remove the lungs and heart to examine closely – cut into the lung tissue, and heart.
  - c. Examine the bronchial lymph nodes – check for oedema, haemorrhage.
3. Open the abdomen and inspect the organs in situ
  - a. Check the liver, spleen and kidneys – cut into each organ
  - b. Check the rumen, small intestine and large intestine – cut them open and look for reddening of the mucosa, haemorrhage, zebra stripes.
  - c. Check the mesenteric lymph nodes – for oedema haemorrhage.

**Table 2. Samples to be collected from post mortem examination**

	<i>Type of sample</i>	<i>quantity</i>	<i>Processing, field storage, transport to lab</i>	<i>Assay</i>
1	Tissue samples from dead animal; lung, retropharyngeal, bronchial and mesenteric lymph nodes, spleen	Two sets of 1cm <sup>3</sup> pieces of tissue.	Put one set of tissues into individual cryovials with 1 ml RNAlater (pre-chilled). Store samples in fridge (4°C) and transport in cool box on ice (or LN <sub>2</sub> ). Put second set of samples into cryovials, store and transport samples in LN <sub>2</sub>	Real-time RT-PCR, positives for conventional RT-PCR, sequencing of positives  Virus isolation

## Follow up

Having found a positive flock, the next step is to determine the extent of the outbreak – how many more flocks are affected, where are these located? How do these flocks move and make contact with other flocks from other areas? If other areas are identified as possibly affected, continue the PDS in these areas.

## Materials required

- [Outbreak investigation form with clinical examination form \(Annex 10\)](#) - paper or ODK
- [Information sheet 6: PDS/ Outbreak](#) investigation
- PPRV rapid diagnostic test kit
- Sampling kit – a waterproof box containing clinical thermometers, sterile nylon swabs on plastic applicator, 2cm screw-top cryovials, 10cc plain (red top) vacutainers, vacutainer needles (18g x 2.5 cm) and needle holders, sterile disposable pipettes, post mortem kit (scalpel and blades, smooth and rat-tooth forceps, scissors, post mortem knife), 4-5cc screw-top cryovials (for post mortem tissues), RNAlater, latex gloves, permanent market pen (fine tip), self-seal plastic bags, cotton wool, paper towel, soap
- Cool box with frozen ice packs – to store the rapid diagnostic test kit, and to transport samples.
- Liquid nitrogen flask filled with liquid nitrogen (if available) – alternatively put samples in the cool box.
- Notebook and pens
- Camera

Notes:

## 7. Market survey

This research tool aims to collect data on small ruminant trading practices and market networks.

### Method

Each of the main small ruminant markets in the study area should be visited for data collection. There are three parts to this tool:

- A.** Key informant interview with the market manager or other key person who is knowledgeable about the market, focusing on the general characteristics of the market.
- B.** Market observations made by the research team of the number and type of small ruminants in the market, and any sick animals seen during the course of the market visit.
- C.** Questionnaire by face-to-face interview with individual people who are buying and/or selling animals in the market, about the sources and destinations of the animals, the reasons for buying and/or selling, transport method, trading patterns and disease problems.

### Format

The three market survey tools are programmed in ODK (labeled market surveys A, B, C).

Researchers may also choose to take notes of key informant interviews and market observations (A and B) in a notebook and enter the data into ODK afterwards. For the market survey questionnaire with buyers and sellers (market survey C) – this is best done using the tablet in ODK.

### Informed consent

Read the project information sheet and get verbal consent for tools A and C. Tool B is the researcher's observations in the market, so does not require consent. Document consent within ODK.

See [Information sheet 4: Market survey A - Key informant interviews](#) and [Information sheet 5: Market survey C – Questionnaire with buyers and sellers](#).

### Field team roles

At each market, the field team will identify and arrange to meet with the market manager/person in-charge to introduce the project and obtain permission to collect data, and then conduct a short interview using the

ODK form or the key informant questionnaire ([Market survey A in Annex 12](#)).

During their visit to the market, the field team will observe the general layout of the market and estimate the approximate number and types of sheep and goats being traded. They should also keep a note of any sick animals observed as they move around the market ([Market survey B in Annex 13](#)).

During the market day, the field team will conduct structured interviews with people buying and/or selling sheep and goats using the questionnaire (Market survey C), programmed in ODK.

### **Participants**

The key informant(s) to be interviewed are the market manager, or another person with good knowledge of the market characteristics, such as a livestock or animal health office on duty at the market.

The questionnaire (Market survey B) should be conducted by face-to-face interviews with individuals who are buying and/or selling sheep and/or goats in the market. A minimum of 20 people should be interviewed, or 10% of the people buying and/or selling in the market, whichever is greater, depending on the size of the market. If the number of people buying and/or selling in the market is 200 or less, then the team should interview 20 of them. If there are more than 200 buyers and sellers, then the team should interview 10% of them (Table 3).

**Table 3. Number of interviews by market size**

Approximate number of buyers and sellers	Number of interviews
Up to 200	20
250	25
300	30
350	35
400	40
Etc.	

The people to be interviewed should be selected randomly or systematically to obtain a representative sample of all types of buyer and sellers and to avoid bias. The research team for each country should discuss how their markets are laid out and make a plan of how to obtain an unbiased sample. If the markets are laid out in a rectangular enclosure, then the field team should walk a transect from one corner of the market, diagonally across the market area to the opposite corner, interviewing every person buying and selling that they meet along the transect. Having completed one transect, if more interviews are required,

a second transect can be made starting in a different corner. However, if the market is circular with all the people buying and selling arranged around the edge with very few in the middle, then the team can start at one point and move around the edge of the circle, interviewing everyone that they meet. Having completed the transects or circle, it may become clear that some key types of buyers or sellers have been missed e.g. sometimes the commercial traders are very busy and moving quickly in the market place so the team has not managed to meet many during the transect. In this case, they can be purposively tracked down for interview in addition to the 20 people/10% people interviewed in the main market area.

### **Duration**

The key informant interview should take about 10-15 minutes. The questionnaires in the market should take about 10-15 minutes – they are designed to be carried out fairly quickly whilst standing in the marketplace.

### **Preparation**

Prior to data collection, visit the area to introduce the project to the key local leaders such as area vets, community leaders and administrative officials. At the same time identify markets and organise dates for visiting them.

### **Implementation**

#### **Data collection in the market using Market survey C**

1. Walk a transect of the market (e.g. if the market area is square or rectangular, walk diagonally from one corner to another), interviewing everyone that you meet along the transect (if they are willing to be interviewed). If necessary, do another transect between the other two corners, in order to achieve the number of interviews required.
2. With each person, introduce yourself and the team.
3. Have the participant introduce themselves (but no need to record their name).
4. Setting the scene: introduce the project and explain that you are collecting information about the sheep and goat marketing in this area and are conducting short interviews with buyers and sellers.
5. Take them through the consent statement and obtain verbal consent.

## **General instructions: Market surveys B and C**

### **Types of buyers and sellers**

The aim of this question is to differentiate between people who are buying and selling animals as a business (traders) and people who are buying and/or selling animals for their own flock. A middleman or broker is someone who is acting on behalf of someone who wants to sell animals and negotiates with potential buyers, taking a percentage of the selling price as a fee.

### **Classification of markets**

If the buyer/seller does not know the type of markets that they go to, you can ask the key informants for this information after you have completed the interviews:

- Primary market - located close to the place of production or rearing of small ruminants, usually located within villages or small towns.
- Secondary market - usually found in suburbs, animals are transported some distance from their place of production/rearing to the market.
- Tertiary or final consumption market - generally located in towns or populated areas to supply urban populations, animals are transported quite a long-distance from their place of production/rearing.

### **Patterns of trading**

This question aims to find out about the trading routines for traders who do business in more than one market, so that we can identify the linkages between the markets. For example, a trader might buy animals in market A, transport these to market B to sell while buying more animals in market B to take to market C, etc. This is important for trying to understand how disease might be passed from one market to another.

### **Follow up**

If during the course of data collection, the field team receives information about cases of suspected PPR, then plans should be made to visit the flock or place where the cases are reported to be to conduct PDS and outbreak investigations. See sections [5: Participatory disease surveillance](#) and [6: Outbreak investigation, sample collection, and post mortem examination](#).

## Materials required

- Tablets for data capture (GPS incorporated in the tablet) or paper questionnaire if using a tablet is a barrier to data collection.
- Notebook and pen for making notes of key informant interviews.
- [Consent form \(Annex 1\)](#)
- [Information sheet 4: Market survey A - Key informant interviews](#) and [Information sheet 5: Market survey C - Questionnaire with buyers and sellers.](#)

Notes:

## **8. Flock dynamics**

This research tool aims to collect longitudinal data on the numbers of small ruminants being born and dying, and entering and leaving the flocks over a one year period, to better understand the relative importance of different reasons for entering and leaving, and how this varies during a one year cycle.

### **Method**

70 households will be randomly selected (if possible) from among those households that participated in the household survey. These households will be visited or contacted by phone every month for 12 months and a questionnaire carried out to obtain data on the numbers of animals entering and leaving the flock over the previous one month.

### **Format**

A questionnaire will be administered using ODK.

### **Informed consent**

At the time of the first visit, information about the project and the flock dynamics study will be provided to the livestock keepers and they will be asked if they are willing to participate, and their written or verbal consent to participate obtained.

### **Field team roles**

The researcher will conduct a face-to-face interview with the main person or persons managing the flock using the flock dynamics questionnaire in ODK software on the tablet. The questionnaire should be conducted in the local language, so if necessary, an interpreter will accompany the researcher. After the first few months, it may be possible to conduct the questionnaire over the phone, especially if the flock migrates to another area during the course of the year.

### **Participants**

For the selected households, the main person or persons who manage the flock will be interviewed using the flock dynamics questionnaire.

### **Duration**

The questionnaire should take no more than 30 minutes.

### **Preparation**

Prior to data collection, select a sub-set of households from the list of households participating in the household survey. Arrange to visit them to introduce the flock dynamics study.

## Implementation

Before starting the questions, explain to the livestock keepers that you would like to collect information about births, deaths, entries and exits during the one-month period before the interview. Ensure that this is understood and if necessary, identify an event that marks the start of the one-month period, to help with remembering events. For the subsequent months, you can ask about entries and exits since the last interview.

## Follow up

If during the course of data collection, the field team receives information about cases of suspected PPR, then plans should be made to visit the flock or place where the cases are reported to be to conduct PDS and outbreak investigations. See sections [5: Participatory disease surveillance](#) and [6: Outbreak investigation, sample collection, and post mortem examination](#).

## Materials required

- [Consent form \(Annex 1\)](#)
- [Information sheet 7: Flock dynamics](#)
- Tablets for data capture (GPS incorporated in the tablet) or paper questionnaire if using a tablet is a barrier to data collection.
- Notebook for making notes of additional information or observations.

Notes:

## **Annexes**

### **Annex 1. Informed consent form**

Used for all research activities requiring written consent except household survey (see [Annex 2: HH survey informed consent form](#)).

*Printable version below.*

## Epidemiology and control of peste des petits ruminants consent form

Country: \_\_\_\_\_

Site: \_\_\_\_\_

Type of activity: \_\_\_\_\_

Lead Investigator	
Telephone	
e-mail	

Country coordinator	
Telephone	
e-mail	

Enumerator	
Telephone	
e-mail	

1. I (the interviewee) have read the description of this study, which I fully understand, and I have been given the opportunity to ask questions, which have been answered to my satisfaction. **YES/ NO**
2. I understand that participation in this project/interview is entirely voluntary and I have the right to withdraw at any time. **YES/NO**
3. I have been informed that I have the right to not answer specific questions. **YES /NO**
4. I understand that any data collected from me will be held as hard copies and/or electric copies. Any personal information will be held securely on protected computers by the investigators. **YES /NO**
5. I understand that my identity will not be disclosed in project reports or any further documents. **YES /NO**
6. I have the right to see a final copy of the report from this project. **YES /NO**
7. One copy of this form shall be held by me (the interviewee). An additional copy shall be held securely by the lead investigator. **YES /NO**
8. I give permission for ILRI to take photographs of me during the research activity and publish them without my name for research purposes only. I will inform ILRI if I do not want to be photographed. **YES/NO**

I have read, understood, and agree the terms of consent described above.

Name of the interviewee: \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

## **Annex 2. HH survey informed consent form**

Used for household surveys.

**Note:** Respondent can mark no for item 9 only (consent to have flock examined), but still consent to the household survey only.

*Printable version below.*

## Epidemiology and control of peste des petits ruminants (PPR) consent form for household surveys

Country: \_\_\_\_\_

Site: \_\_\_\_\_

Type of activity: \_\_\_\_\_

<b>Lead Investigator</b>	
Telephone	
e-mail	
<b>Country coordinator</b>	
Telephone	
e-mail	
<b>Enumerator</b>	
Telephone	
e-mail	

1. I (the interviewee) have read the description of this study, which I fully understand, and I have been given the opportunity to ask questions, which have been answered to my satisfaction. **YES/ NO**
2. I understand that participation in this project/interview is entirely voluntary and I have the right to withdraw at any time. **YES/NO**
3. I have been informed that I have the right to not answer specific questions. **YES /NO**
4. I understand that any data collected from me will be held as hard copies and/or electric copies. Any personal information will be held securely on protected computers by the investigators. **YES /NO**
5. I understand that my identity will not be disclosed in project reports or any further documents. **YES /NO**
6. I have the right to see a final copy of the report from this project. **YES /NO**
7. One copy of this form shall be held by me (the interviewee). An additional copy shall be held securely by the lead investigator. **YES /NO**
8. I give permission for ILRI to take photographs of me during the research activity and publish them without my name for research purposes only. I will inform ILRI if I do not want to be photographed. **YES/NO**
9. I give my permission for my flock to be examined. **YES/NO**

I have read, understood, and agree the terms of consent described above.

Name of the first interviewee: \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Signature of enumerator (if signing on behalf of interviewee) \_\_\_\_\_

Name of the second interviewee: \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Signature of enumerator (if signing on behalf of interviewee) \_\_\_\_\_

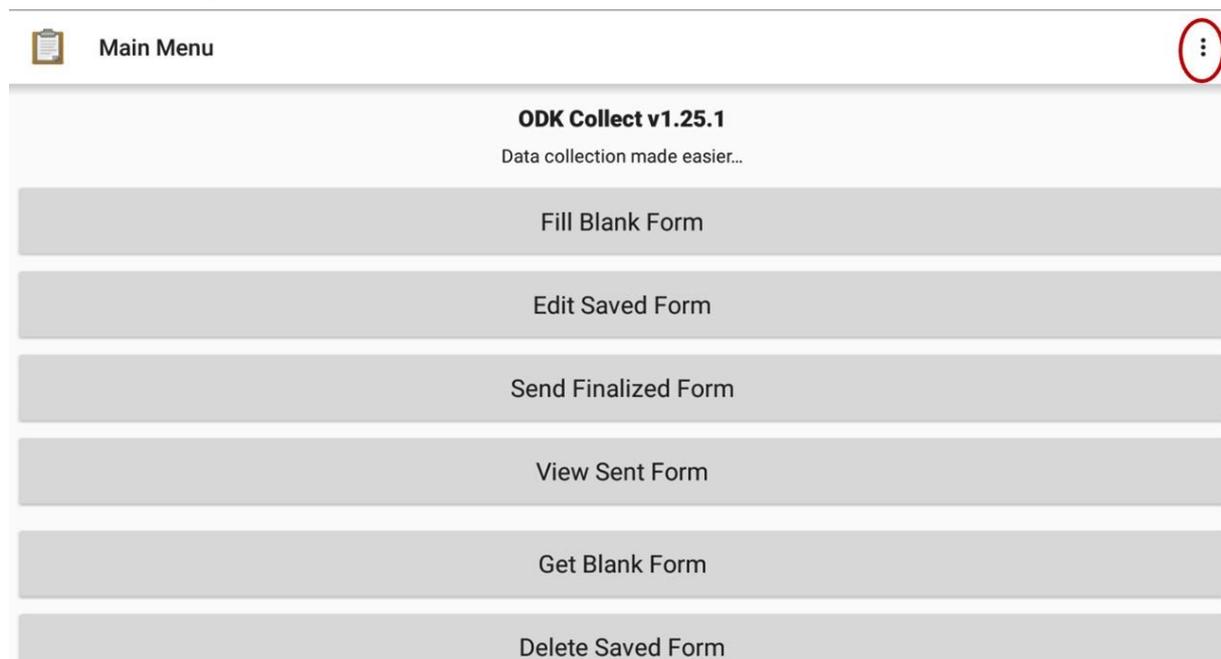
## Annex 3: Viewing tools within ODK

### How to view the ECo-PPR tools electronically within Open Data Kit (ODK)

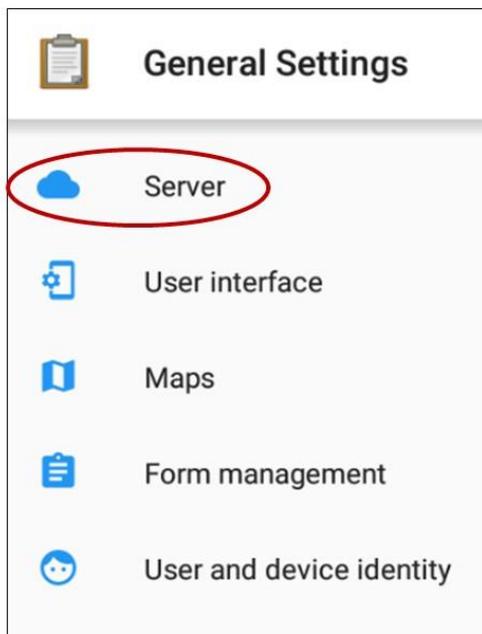
*The best way to see digital ECo-PPR tools to view the electronic version programmed into ODK. To do this, you need an application called ODK Collect. Once you have ODK Collect, connect to the ILRI server using a password, and download the current tools. You can use an Android phone or tablet. If you use a computer, you also need to download a program called Bluestacks. The instructions below are for using a computer.*

#### GETTING ODK AND CONNECTING TO THE SERVER FOR THE FIRST TIME

1. Download ODK Collect onto a tablet or mobile phone. If you are using a computer, you will need to download [BlueStacks](#) first, then search for ODK Collect within the Google Play Store.
2. Open ODK Collect. If you are using a laptop, it will open within Bluestacks.
3. Click on the Action Button (three stacked dots) and select General Settings.



#### 4. Select Server

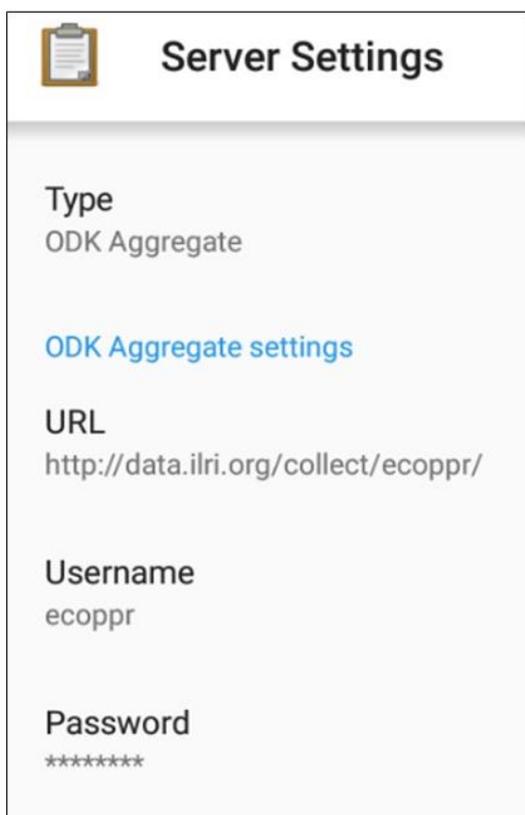


#### 5. Enter the settings below as instructed by the field lead:

URL:

Username:

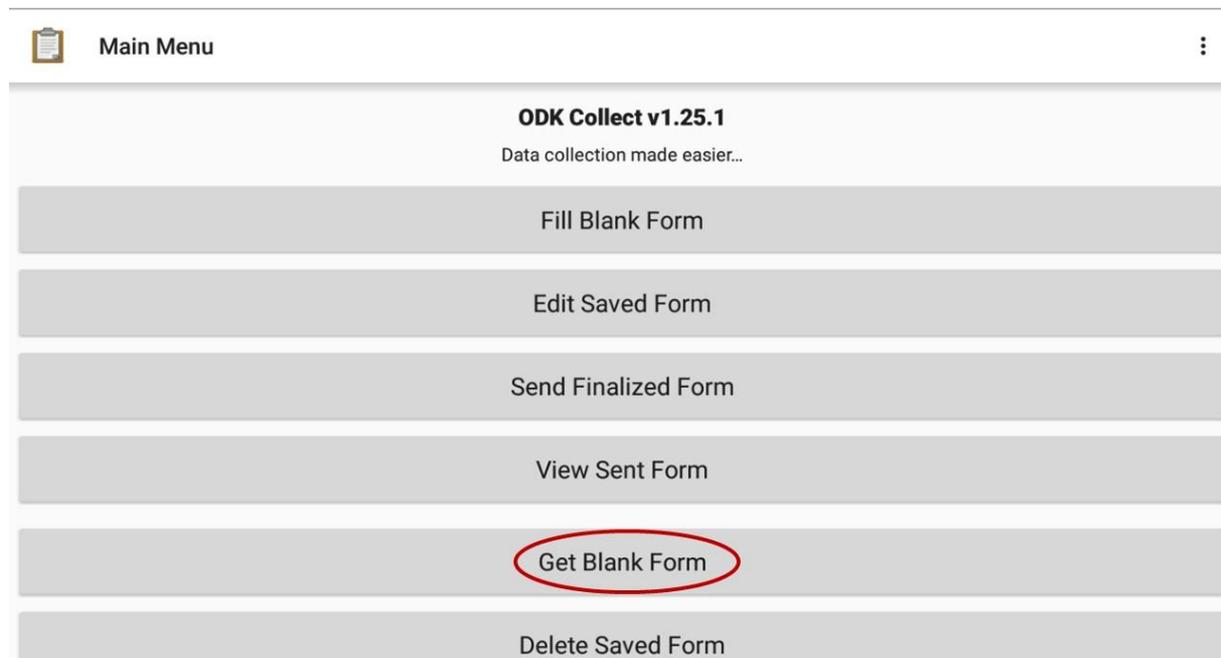
Password:



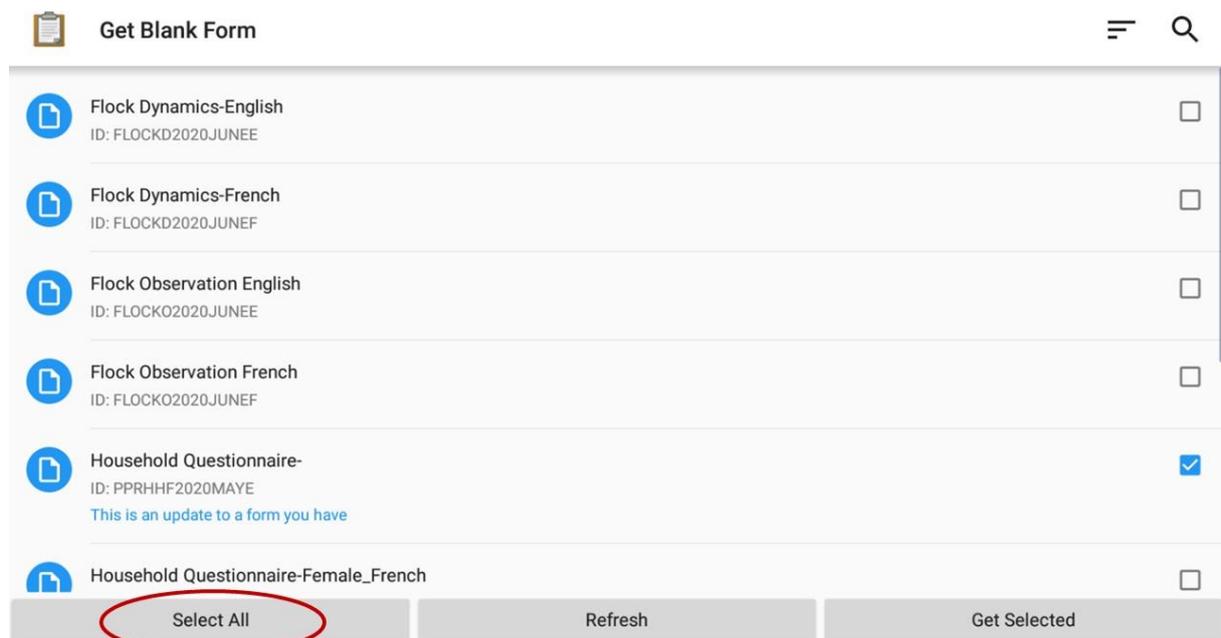
## GETTING BLANK FORMS

Follow these instructions to download the tools for the first time OR after any updates.

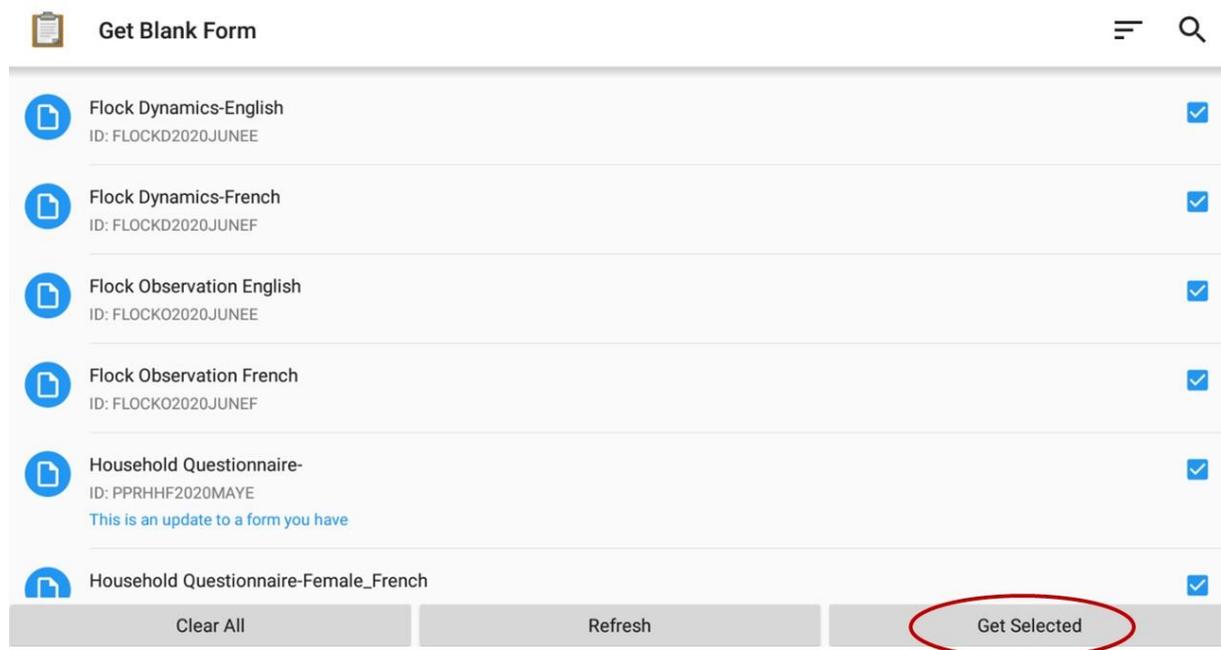
1) Open main menu and select "Get blank form"



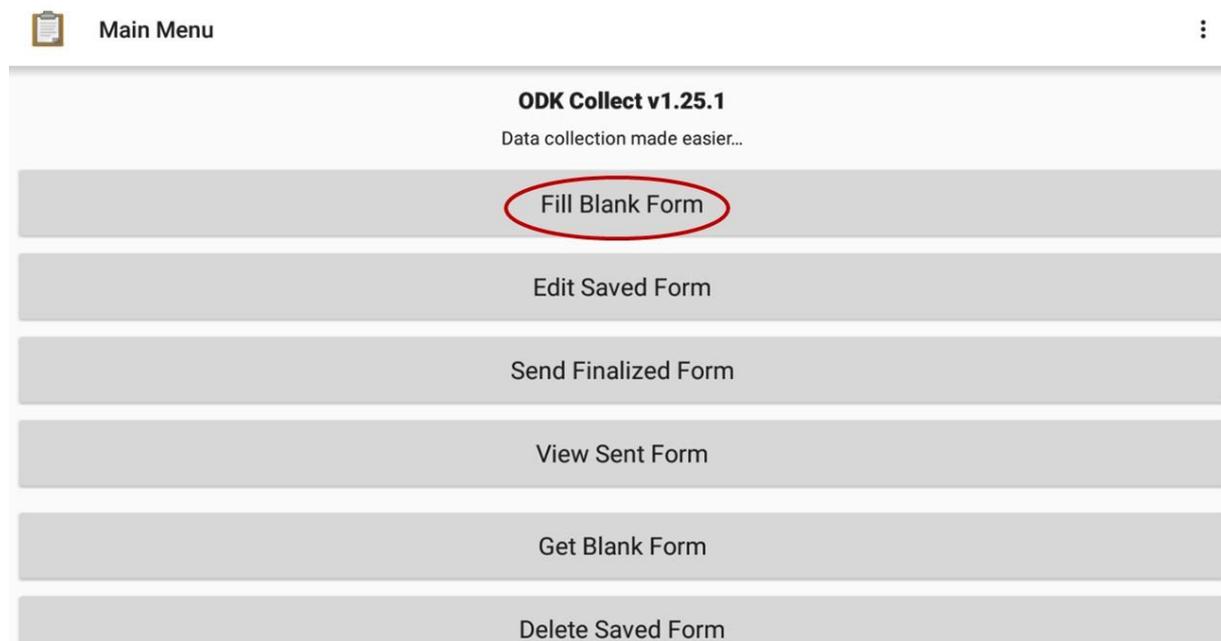
2) Click on "Select all"



3) Click on "Get selected"



4) When you return to the main menu, choose "Fill blank form" to choose the tool you want to use.



## **Annex 4. Key informant interview with veterinarians guide**

*Printable version below.*

# Key informant interviews with veterinarians guide

## Key topics for discussion

### *Main disease problems in the area*

- Main animal diseases? Especially small ruminant diseases.
- Seasonality of disease occurrence or outbreaks
- Mortality/morbidity
- Data on PPR occurrence in the area

### *What is the animal health service capacity?*

- Personnel (vets, CAHWs, paravets)
- Resources, communications, transport, cold chain, etc.
- Disease surveillance system
  - o Disease reporting system
  - o Active surveillance, outbreak investigation
- Disease control measures
  - o Preventive
  - o Control of outbreaks, or disease problems

### *Delivery of vaccines*

- How are vaccines delivered along the vaccine chains?
  - o Source, transport, storage, distribution
  - o People involved
- What are the factors affecting quality of vaccination services?
- Willingness of livestock keepers to vaccinate and to pay for vaccinations
- Cost of vaccines and perceptions of livestock keepers

### *Main markets and trade routes*

- Trading practices and market network
  - o Where are the markets located? Formal and informal markets
  - o Approximate size of each market (number of sheep and goats, number of buyers/sellers/traders per market day)?
- What are the trade routes?
- Live animal inspections

### *PPR interventions*

- High risk areas for PPR disease occurrence – where, why are they at higher risk?
- What is the best strategy for PPR control in this area?
  - o Seasonality – livestock keeper's preferred time for vaccination
  - o Identification/traceability
  - o Advocacy for vaccination
  - o Involvement of different gender groups

### Key informant interview with veterinarians

Interview code				
Name(s) of interviewer(s)				
Location		Date		
Name(s) of main interviewee(s)		Position		
Interview type	Individual/ Group	No. interviewees	Male	
			Female	

#### *Main disease problems in the area*

- Main animal diseases? Especially small ruminant diseases.

- Seasonality of disease occurrence or outbreaks

- Mortality/Morbidity

- PPR occurrence data









**Annex 5. Community meeting tool**

*Printable version below.*

# Community meeting guide

## Topics for discussion

### 1. Livelihoods

- What are your main sources of livelihood e.g. livestock, agriculture, other?
- What livestock species are you keeping?
- Which species is most important/matters most to you? Rank the species in order of importance – what are the reasons for the ranking? [Use the animal cards. If men and women are together, ask them to do this activity in separate groups]
- What are the objectives for sheep and goat keeping (for food, income, social event, prestige, etc...)?

### 2. Overview of area - discussion and participatory mapping [see method for Participatory Mapping – this activity should take max. 30 minutes]

- To help us to understand your area, let us draw a map showing the locations of key resources that are important for sheep and goat keeping:
  - grazing areas and watering places (wet and dry seasons)
  - distribution of households and livestock (wet and dry seasons)
  - protected areas/conservancies
  - animal health services, agro-vets
  - livestock markets and trade routes
  - seasonality of transhumance and transhumance routes
  - wildlife areas

### 3. Small ruminant movements – discussion using map

- Daily movement – how far?
- Seasonal – where, how far?
- Do their flocks come into contact with flocks of other areas? Which areas and where?

#### **4. Small ruminant flock dynamics**

- How often do they sell animals?
- Who makes the decision about selling animals?
- How often do they buy animals? For what purpose?
- What are the other ways besides formal markets that animals can enter or leave the flock? E.g. Loans, gifts, inheritance, marriage

#### **5. Seasonal calendar**

- We would like to understand what happens at different times of the year for sheep and goat production. We are going to create a calendar that represents a typical year. [see method for Seasonal Calendar in [Annex 6: Community meeting – Supplementary instructions](#)]
  - Rainfall, lambing/kidding, buying and selling sheep and goats, market prices of live animals, availability of water and forage, transhumance period.
  - Seasonal labour – What work is associated with different seasons? How much time/ effort is needed for sheep and goat production activities at different times of year?

#### **6. Small ruminant disease problems – by species**

(Do this activity with men and women in separate groups)

- a. What are the main sheep and goat diseases in this area? For each disease:
  - i. What is the local name? and what does the name mean?
  - ii. what are the clinical signs?
  - iii. What age groups are affected?
  - iv. what causes the disease?
  - v. what do they do to treat the disease?
  - vi. what do they do to prevent the disease?
- b. For the list of diseases named, ask them to rank the diseases based on mortality caused. [see method for Simple Ranking]

## **7. Timeline of disease events over the past ten years**

(Men and women together again)

- have there been any major disease outbreaks during the past ten years? What disease, when, where? [**see method for Timeline**]

## **8. Seasonality of main diseases – seasonal calendar**

- We would like to talk about the main small ruminant diseases that you have listed and their seasonality of occurrence throughout the year. We are going to use the calendar that we created earlier to show when the diseases occur during a typical year. [**see method for Seasonal Calendar**]

## **9. Impact of outbreak and action taken to control disease**

- When there is an outbreak, how long does it last? How is the community affected and what changes happen in the community?
- when disease occurs in their flocks, what action do they take?
  - Their own actions?
  - who do they seek assistance or advice from?
  - If there is a serious disease problem, who would you report this to?
- Where do they get medicines and vaccines? – what are the main products used?
- Vaccination strategy
- Seasonality – when is the livestock keeper's preferred time for vaccination? Does this differ by disease?
- Identification of vaccinated animals - do the livestock keepers use any system of identification?
- Do you organise group vaccination?

## **10. (Optional, if the group has been divided into men and women)**

### **Re-unite group and compare men's and women's findings**

Re-unite the men's and women's discussion groups. Select a spokesperson from the women's and men's discussion group and ask them to share the

main findings of their seasonal calendar, specifically focusing on work tasks and effort required at different times of the year.

**11. Other topics of importance to the participants, time for questions**

If the participants have raised any issues during the meeting that were outside the scope of the interview, allow some time to talk about these, provide some advice, opportunity for them to ask questions.

**12. Explain about the next activities, thank you and closing.**

## Community meeting form

Interview code			
Name(s) of interviewer(s)			
Date			
Location of interview		District/county	
Number of participants	Male		<i>Attach list of participants, with name, position/occupation, gender</i>
	Female		

### 1. Livelihoods

- What are your main sources of livelihood e.g. livestock, agriculture, other?

- What livestock species are you keeping?

- Which species is most important? Rank the species in order of importance – what are the reasons for the ranking? (*Encourage having men and women do this activity as separate groups and returning together to share results.*)

Men's ranking		
Species	Rank	Reason

Women's ranking		
Species	Rank	Reason

- What are the objectives for sheep and goat keeping (for food, income, social event, prestige, etc...)?

## **2. Overview of area - discussion and participatory mapping – insert photo or sketch of map**

To assist in interpreting the map, describe: grazing areas and watering places, distribution of households and livestock, protected areas/conservancies, animal health services, agro-vets, livestock markets and trade routes, Seasonality of transhumance/routes, wildlife areas, etc. For large distance movements, use arrows and provide information on estimated distance (for example: time it takes to get there).





## 5. Seasonal calendar

Note: rainfall is given to facilitate to identify the important seasons and their duration, no need to collect detailed information on this, but it helps to understand timing of the different livestock related information listed below.

<b>Seasons</b>					
Months					
Rainfall					
<i>Lambing period</i>					
Kidding period					
Selling sheep and goats					
Buying sheep and goats					
Market price for sheep and goats					
Availability of water for sheep and goats					
Availability of forage for sheep and goats					
Transhumance (movement away from home area)					
Labour for sheep and goat husbandry					
Small ruminant workload for men					
Small ruminant workload for women					
Other activity/event					

<b>Seasons</b> (copy from above)					
Disease 1					
Disease 2					
Disease 3					
Disease 4					
Disease 5					
Disease 6					

## 6. Small ruminant disease problems – by species

Men's disease rankings							
Disease name	Meaning of name	Clinical signs	Age groups affected	Cause	Treatment	Prevention	Rank by mortality

Women's disease rankings							
Disease name	Meaning of name	Clinical signs	Age groups affected	Cause	Treatment	Prevention	Rank by mortality

### 7. Timeline of disease events over the past ten years

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Disease event										
Other events										

*Here the idea is not to know the exact date/year, often major outbreaks are remembered in context of other important events in the area and help to time it.*

### 8. Seasonality of main diseases – seasonal calendar

**(See seasonal calendar above)**



- Identification of vaccinated animals - do the livestock keepers use any system of identification?
- Do they organise group vaccination?

## **10. Other topics of importance to the participants, questions**

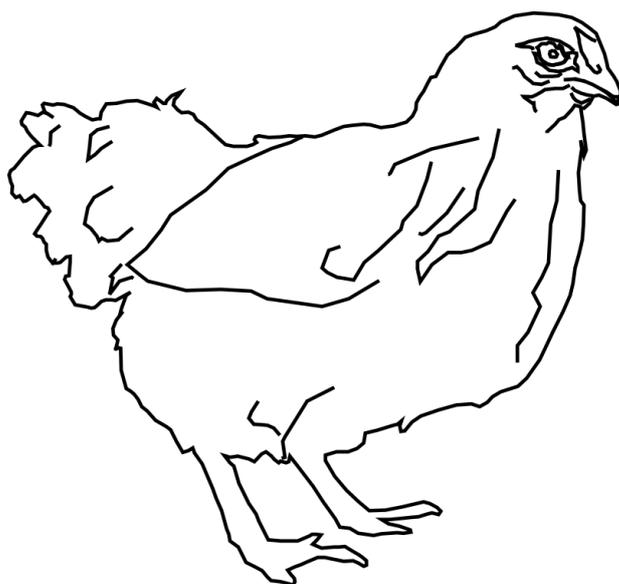
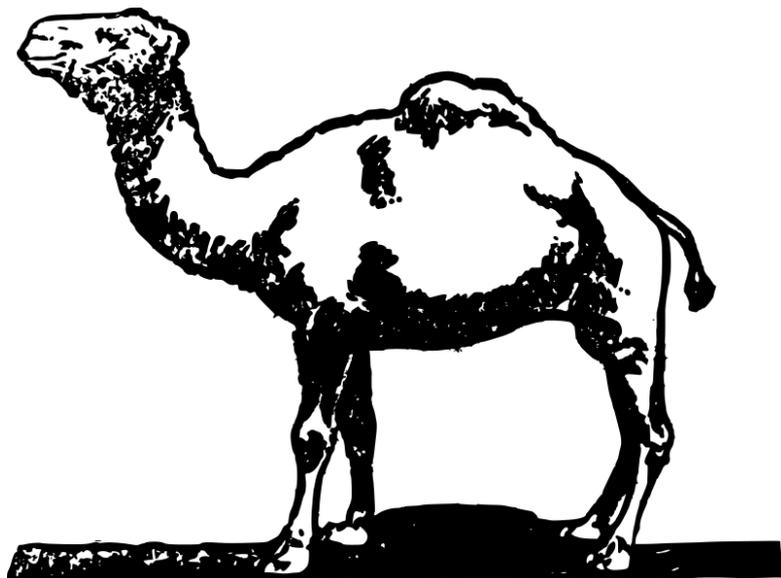
Give details of discussions

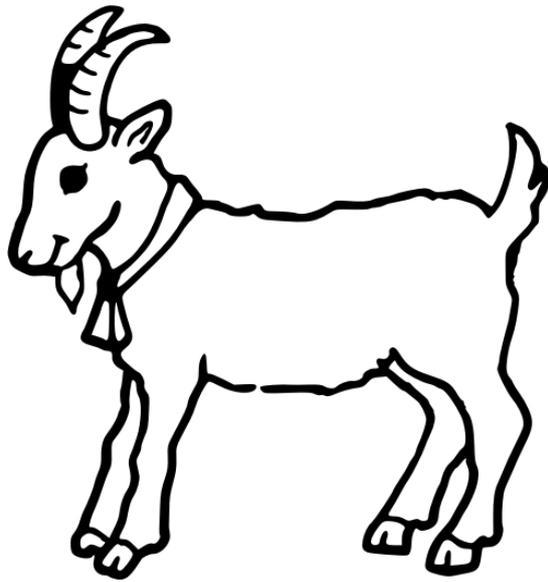
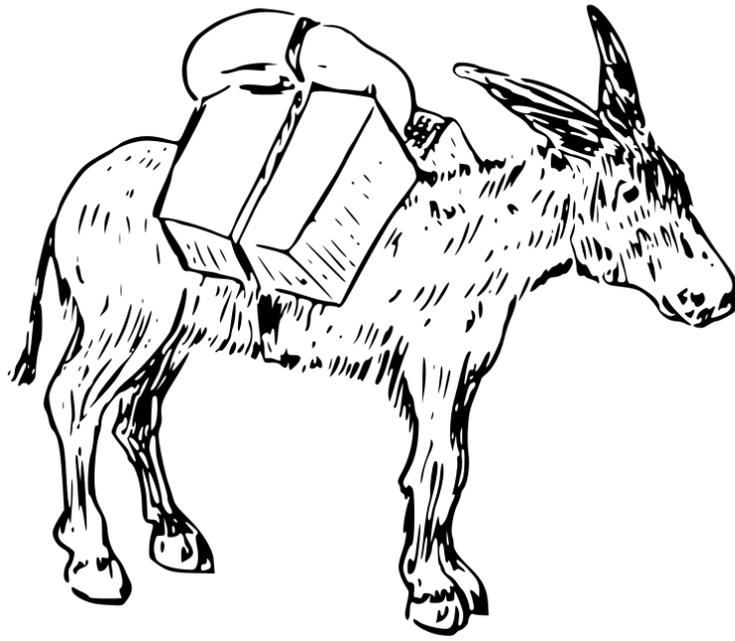
**List of participants**

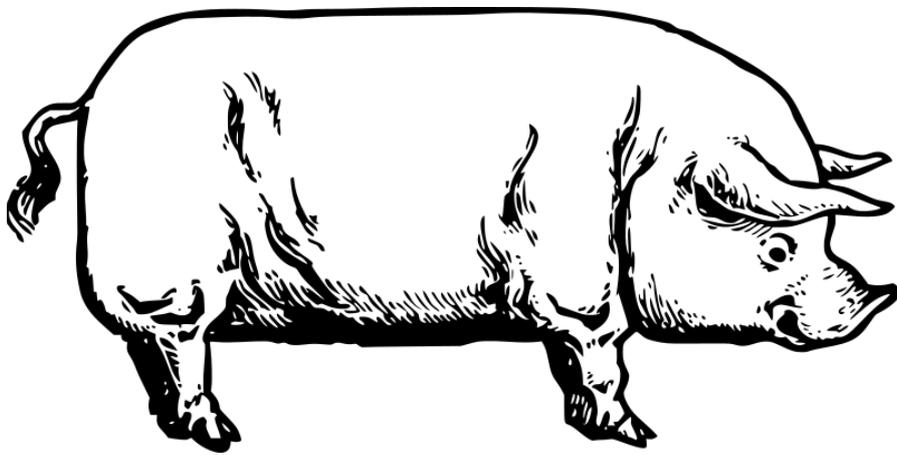
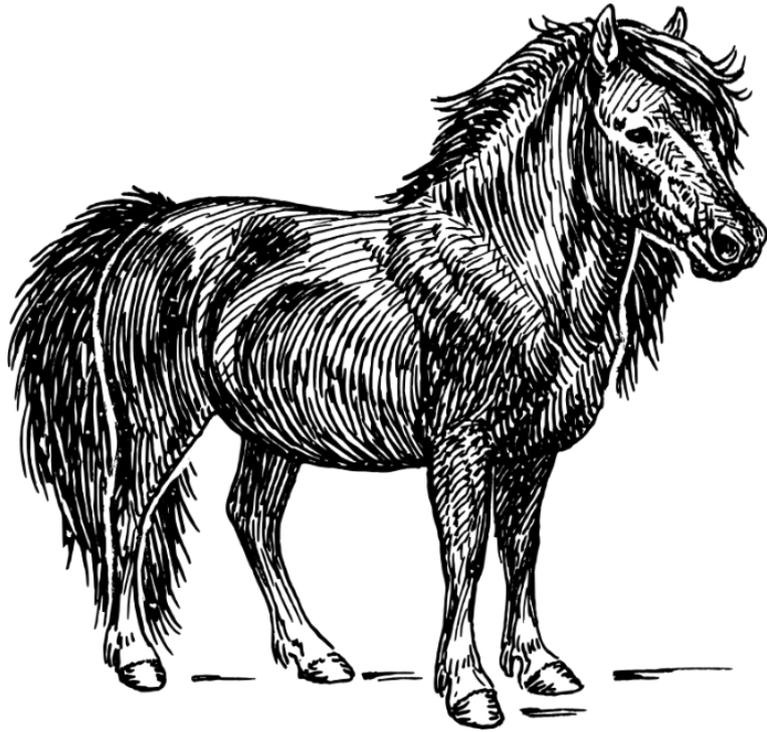
Name	Surname	Position/occupation	Gender (Male/Female)	Signature

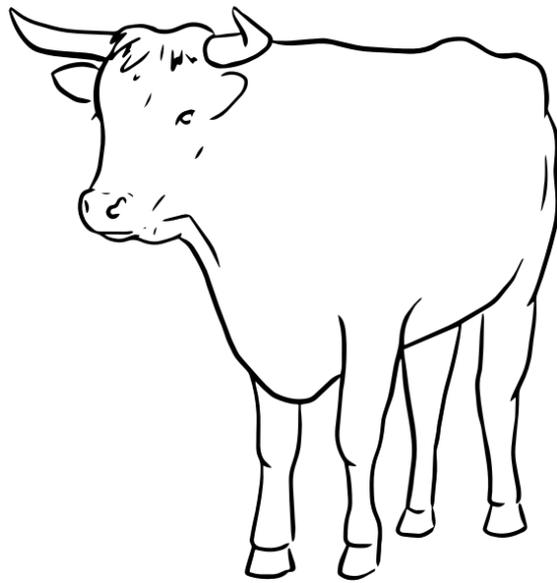
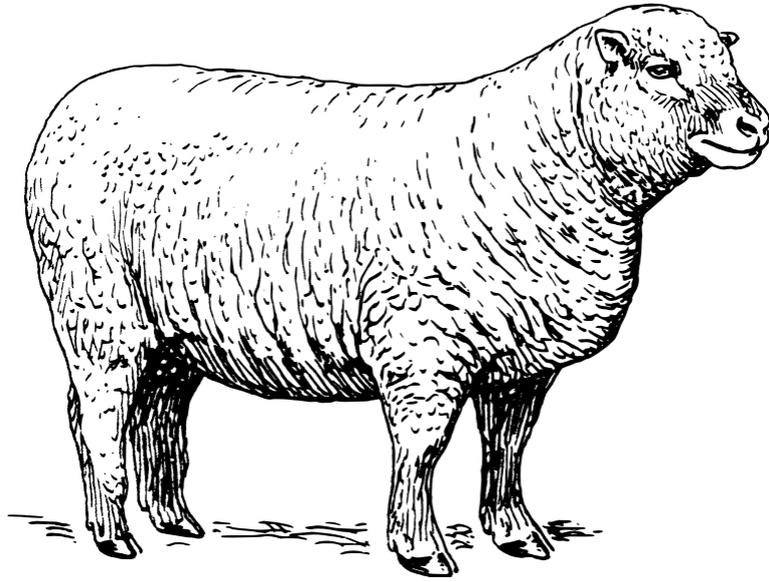
## **Livestock species ranking cards**

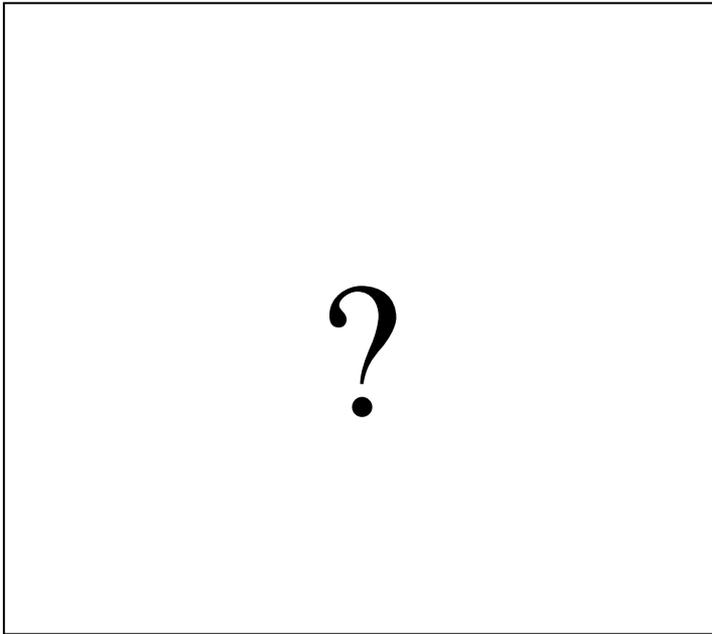
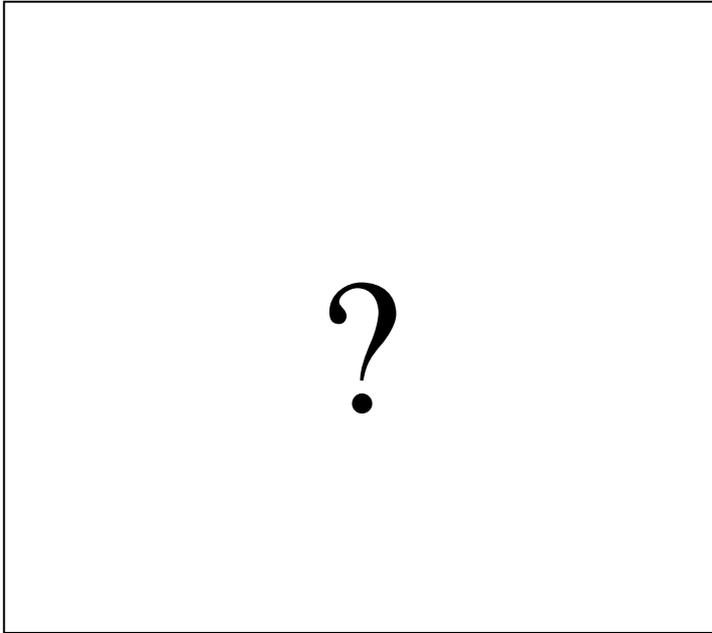
Printable version below. Print two sets, one for men and one for women. The question mark card can be used for any animal not shown.











## **Annex 6: Community meeting – instructions for PRA tools**

*Printable version below.*

## **Community meeting – instructions for PRA tools**

These instructions describe participatory rural appraisal (PRA) techniques in more detail.

### **Methods for simple ranking**

#### **1. Simple ranking** – of livestock species in order of importance

Simple ranking is a fairly quick method for understanding issues from the point of view of the participants. A group of items is arranged in order based on defined criteria.

#### **Method**

1. What livestock species are you keeping in this area?
2. Using cards prepared in advance with pictures or names of the livestock species, place the cards on a table or the ground where all the participants can see them.
3. Ask the group to rank the species in order of their importance in the area.
4. Give them time to discuss and rank the species cards by consensus. Encourage them to make adjustments if they want to. When they appear to have finished, ask them if they all agree on the result.
5. Leaving the cards in place, summarise and cross-check their ranking e.g. you have ranked goats first, is this correct? And cattle are second? Correct? Etc.
6. Probe the results. Why did they put this species first, why this one last, why is this one above this one? etc.
7. Record the ranks for each species, and the reasons given for the ranking, as well as notes of any discussions during the exercise.

#### **2. Simple ranking - small ruminant diseases by mortality**

#### **Method**

1. What are the main small ruminant disease problems in this area?
2. Write the disease names on cards or draw pictures representing each disease and place the cards on a table or the ground where all the participants can see them.
3. Ask the group to rank the diseases based on the level of mortality that they cause, putting the one causing highest mortality first.

4. Give them time to discuss and rank the disease cards by consensus. Encourage them to make adjustments if they want to. When they appear to have finished, ask them if they all agree on the result.
5. Leaving the cards in place, summarise and cross-check their ranking e.g. you have ranked disease X first, is this correct? Followed by disease Y? Etc.
6. Record the ranks for each disease, as well as notes of any discussions during the exercise.

### **3. Participatory Mapping – key resources for sheep and goat keeping**

Mapping can be a very useful tool for participatory epidemiology, especially at the beginning of an enquiry to define the population and system under investigation. Maps can be prepared by the participants to provide spatial information about the layout of their village and the surrounding area, its key features, natural resources, agriculture, markets, etc. They can be used to show the location of disease outbreaks, how disease spreads through an area over time, how livestock move in the area and their contact with other groups, and risk areas for disease occurrence. They can be drawn on paper with coloured market pens, or on the ground using locally available materials – if objects and symbols are used then illiterate people can easily participate.

#### **Method**

1. Explain to the participants, that you would like them to prepare a map to help you to understand the area and the locations of important resources for sheep and goat keeping?
2. To get the participants started, it can be helpful to assist them to mark two or three easily identifiable reference points such as the location of the meeting, a health post or school, a main road or river. It is important that the map is large enough so that everyone can see it and contribute to its development.
3. Request them to draw key livestock features:
  - a. grazing areas
  - b. watering places
  - c. locations of households and livestock
  - d. animal health services, agro-vet shop
  - e. livestock markets

- f. trade routes
- g. slaughtering sites
- h. seasonal movements of flocks and transhumance routes
- i. wildlife areas

4. Once the map is completed, make sure you understand what has been drawn. Ask questions to clarify if necessary.

5. To finalise the map, find out which direction is north and mark it on the map. Also try to obtain an idea of scale by asking the distance between two key points, then add an approximate scale. If symbols are used to represent features, add a key to the map.

6. Take a photo of the map as a record or make a sketch of it.

#### **4. Seasonal calendar – small ruminant activities/events, and diseases**

Many aspects of livestock production and marketing show seasonal or monthly variations such as weather, livestock movements, livestock disease, etc. A seasonal calendar can be used to visualise and analyse local perceptions of seasonal variations in livestock practices, diseases, risk factors etc. The information can be useful for planning disease control activities such as timing of vaccination.

To be able to construct a seasonal calendar it is first necessary to be familiar with local terminology and descriptions of seasons and how these relate to the months of the year. The seasonality of different events or activities of interest is then demonstrated by scoring occurrence in relation to the seasons. In most areas it is interesting to first obtain the seasonality of rainfall, but variation in temperature may also be of interest. Other seasonal factors such as availability of grazing, access to water, presence of wild animals, or presence of vectors may be of interest depending on the production system, species and diseases of interest. Livestock management and marketing practices may be seasonal such as movement of livestock, calving/lambing seasons, buying in stock or off-take. Human activities such as festivals and holidays can affect numbers of livestock, marketing and slaughter. Having developed the seasonal calendar, the results are then discussed and probed with the participants to find out why things happen at certain times and how they are related to other factors.

## Method

Explain to the participants that you would like to understand what happens at different times of the year for sheep and goat production, by creating a calendar that represents a typical year.

1. Agree on the main seasons of the year with the participants - write these across the top of a matrix.
2. Check which months fall in which season and write these in the row 2.
3. Provide 30 counters and ask the participants to show how rainfall is distributed across the seasons (row 3).
4. Taking one activity or issue at a time, ask the group to use the 30 counters to show how frequently that activity or issue occurs in the different seasons.
5. Repeat for each item, keeping notes of the discussions that go on while they are deciding on the scoring. If other key activities/issues/events are mentioned, these can be added to the calendar.

Seasons	Season A	Season B	Season C	Season D	Season E
Months					
Rainfall					
Lambing period					
Kidding period					
Selling sheep and goats					
Buying sheep and goats					
Market price for sheep and goats					
Availability of water for sheep and goats					
Availability of forage for sheep and goats					
Transhumance (movement away from home area)					
Other activity/event					
Disease 1					
Disease 2					
Disease 3					
Disease 4					

Disease 5					
-----------	--	--	--	--	--

The seasonality of occurrence of the main disease problems of sheep and goats can be added to this calendar by the same method. Add each disease one at a time to the left side of the matrix and ask the participants to use the 30 counters to show how frequently that disease occurs in each season. Repeat this for the main diseases that have been mentioned, keeping notes of the discussions during the scoring.

**5. Timeline – small ruminant disease events in the last 10 years**

Timelines are chronologies of past events that are useful for understanding the history of the current situation and exploring the frequency of key disease events and patterns over time. Besides providing information in itself, the timeline will provide a useful reference for triangulating the year of disease reports made by the community with information collected by the surveillance system. Information on other major events, such as droughts and famines or political events should be collected – these can help to pinpoint the time when a particular disease event occurred. Try to use the local names for years as much as possible.

**Method**

1. Explain that you would like to understand the history of small ruminant diseases in the area.
2. Draw a line on the ground or on a large piece of paper – label one end as “today” and the other end as the start year e.g. 2010.
3. Ask the participants to indicate the timing of key events during the timeframe – what important events have affected the community? Have there been any major livestock events? Have there been any major small ruminant disease events, such as disease outbreaks, times of famine etc.?
4. Probe the timeline e.g. if a disease outbreak has occurred, ask how frequently it has occurred in the area in the past.

## **Annex 7: PDS Key informant interview guide**

*Printable version below.*

## Participatory disease surveillance (PDS) key informant interview guide

Conduct interviews with local leaders and the local veterinarian or para-vet, to explain the purpose of the PDS, which is to understand the main disease problems in the area and obtain their consent to conduct surveillance in the area. Do not specifically mention PPR at this stage because it will bias their answers to your interview questions.

Name(s) of interviewer(s)				
Location		Date		
Name(s) of main interviewee(s)		Position		
Interview type	Individual/ Group	No. interviewees	Male	
			Female	

### Key topics for discussion

*Main disease problems in the area*

- Main small ruminant diseases in this area

- Seasonality of disease occurrence or outbreaks

- Mortality/morbidity

- PPR occurrence in the area – which are the higher risk areas, why are they at higher risk?

### *Animal health services*

- What vaccination has been carried out in this area?

- For which diseases?

- When?

### *Small ruminant movement*

- How do the flocks move – on a daily and seasonal basis?

- What are the main markets and trade routes?

### *Other notes*

## **Annex 8: PDS Community meeting tool**

*Printable version below.*

## Participatory disease surveillance (PDS) community meeting tool

Gather a group of people together from the village or area to discuss small ruminant disease problems (don't specifically mention PPR at this stage). Explain that the project is aiming to better understand small ruminant diseases, in order to improve surveillance and control of those diseases. Obtain their consent to participate. Allow the participants to introduce themselves and introduce the research team.

Use the [List of participants form](#) to record who attended the meeting.

Name(s) of interviewer(s)			
Date			
Location of interview		District/county	
Number of participants	Male		<i>Attach list of participants, with name, position/occupation, gender</i>
	Female		

### Key topics for discussion

#### 1. Livelihoods

- What are your main sources of livelihood e.g. livestock, agriculture, other?

- What livestock species are you keeping?

- Which species is most important? Rank the species in order of importance – what are the reasons for the ranking? (See [methods for simple ranking](#) in Annex 6.)

- What are the objectives for sheep and goat keeping (for food, income, social event, prestige, etc...)?

2. **Small ruminant disease problems – by species**

- a. What are the main sheep and goat diseases in this area? For each disease:
- i. What is the local name? and what does the name mean?
  - ii. what are the clinical signs?
  - iii. What age groups are affected?
  - iv. what causes the disease?
  - v. what do they do to treat the disease?
  - vi. what do they do to prevent the disease?

Disease name	Meaning of name	Clinical signs	Age groups affected	Cause	Treatment	Prevention	Rank by mortality

b. For the list of diseases named, ask them to rank the diseases based on mortality caused. (See [methods for simple ranking](#) in Annex 6.)

c. What diseases are currently affecting your sheep and goats? – if a disease with PPR-like signs is mentioned, find out which flocks are affected and make a plan to visit them to conduct outbreak investigations, rapid test and sample collection (See [section 6. Outbreak investigation, sample collection, and post mortem examination](#)).

If no PPR-like disease cases are described, ask to visit 2-3 flocks with other disease problems. Conduct outbreak investigations and flock examinations in these flocks to ensure that there is no PPR-like disease and provide appropriate advice for the diseases that you see. This demonstrates interest in their livestock and their problems, as well as building up our understanding of other diseases in the area.

If no current PPR-like disease is described or identified during flock visits, try to find out if they have heard of this disease occurring in neighbouring areas. If new areas are identified, then these are the next place to move to for PDS.

Additional notes:

## **Annex 9: Instructions for the PPRV rapid diagnostic test**

*Printable version below.*

# ID Rapid<sup>®</sup> PPR Antigen



Dipstick field test for detection of PPR Virus infection  
Technology derived from reagents developed at  
a FAO/OIE reference laboratory (CIRAD, Montpellier, France).

*For in vitro use*

PPRAGDIP ver 0318 EN



Validated in collaboration with CIRAD

## General Information

Peste des Petits Ruminants (PPR) is a contagious disease affecting goats and sheep primarily in Africa, the Middle East and the Indian subcontinent. It is caused by the Peste des Petits Ruminants Virus (PPRV), a species of the Morbillivirus genus. The disease is highly contagious, with approximately 80 percent mortality in acute disease.

Detection of PPR virus can be useful to identify and monitor new outbreaks. IDvet offers a full range of diagnostic kits to detect PPR virus: an antigen capture ELISA, IDScreen® PPR Antigen Capture, and also a RT-QPCR, IDGene™ Peste-des-Petits-Ruminants Duplex).

The ID Rapid PPR Antigen is a pen-side test based upon reagents developed at a FAO/OIE PPRV reference laboratory (CIRAD, Montpellier, France), also used in the IDScreen® PPR Antigen Capture ELISA. The elution buffer used in the ID Rapid PPR Antigen is fully compatible with the PPR antigen capture ELISA. Therefore, swabs eluates obtained with ID Rapid PPR Antigen can be addressed to a lab for analysis on antigen ELISA for confirmatory diagnosis if necessary.

The test can be used on: **ocular swab (preferred)**, nasal swab, oral swab, or rectal swabs.

## Description and Principle

The XXXX test is a simple direct test (immuno-chromatographic assay) for the detection of all 4 lineages of the PPRV antigen in swabs and can be carried out at pen-side. PPRV antigen-specific antibodies were bound to colloid gold and also immobilized as a thin line on the membrane. Each LFD has a control line (C) to validate the migration.

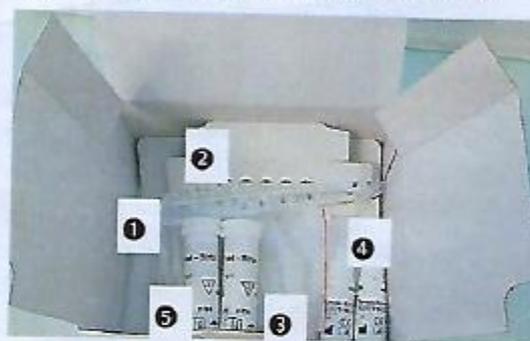
If present in the sample, PPRV antigen binds to the gold conjugate and forms an immune complex. The complex then migrates by capillary action along the membrane until it reaches the immobilized antibody in the Test (T) line. The complex will bind to the immobilized antibody, resulting in an accumulation of colloid gold (a red/purple line) visible by eye. **A band in the Test (T) line indicates a positive result. No band in the Test (T) window indicates a negative result.**

In both positive and negative samples, the excess colloid gold-antibody will be bound to a capture antibody on the control (C) line. This C-band ensures correct test performance and allows for test validation. **Result interpretation on the test (T) line is possible only if there is a band on the Control line.**

## Kit Components

Reagents*
Swabs in peel pouch ①
Portable cardboard rack ②
Soft tubes for swab elution and assay migration ③
Dropper with Elution buffer ④
Hermetic tubes containing 10 dipstick (test strips) + dessicant ⑤
Kit insert

\* Quantities supplied are indicated on the kit label.



## Materials required but not provided

Other swabs than those included in the kit can be used, especially if others are more adapted for the sampling to be done (species, type of sampling). The tip swab can be either made from cotton or viscose or any other appropriated material.

## Precautions

1. All single-use material used for the assays should be considered as potentially infectious materials and should be eliminated in accordance with local legislations/reglementation.
2. **When opening the dipstick tubes, close immediately and tightly the tube to protect the remaining strips from humidity** (dessicant inside the tube lid + dessicant bag)
3. **The dipstick must remain in vertical position after being in contact with the sample, and during all the migration/reaction step.** You can use the cardboard rack –or any other adapted device– for that purpose.

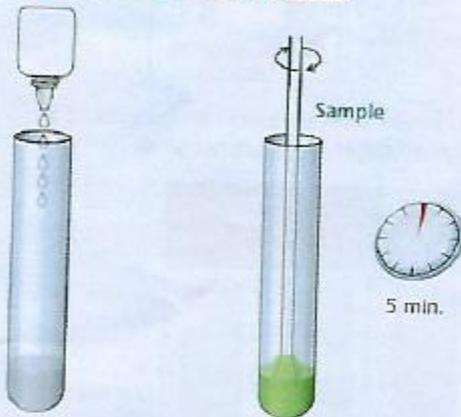
## Storage

All reagent can be stored at room temperature (+4°C to 26°C). After first opening of an hermetic tube, the remaining strips can be used up to 1 month after first opening.

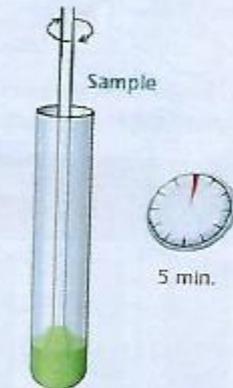
The portable cardboard rack, the swabs and the soft tubes do not have any specific temperature requirement for storage.

Bring all reagent to ambient temperature before beginning the test.

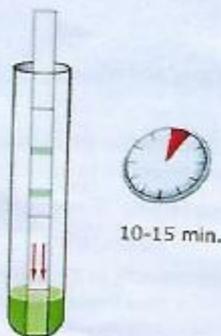
## Test procedure description



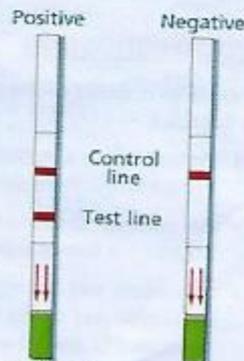
① dispense buffer



② swab elution



③ test



④ results

## Preparation

Assemble the cardboard

## Testing Procedure

Allow all reagents to come to ambient temperature before use. Homogenize the elution buffer dropper by inversion (2 to 3 times).

1. Take one of the soft test tubes provided and add **12 drops** (each drop is approximately 20µL) **of the provided buffer from the dropper bottle.** Label the tube with animal ID.



2. **Swab** the inside of the lower eyelid, or the inside of the nose, of the suspect infected animal. Eye swabs are generally preferred to nasal swabs. If not tested immediately, the swab can be kept dried.

3. Place the **swab tip into the soft test tube containing the buffer.** Press several times (during 5 seconds) the soft test tube **onto the swab tip** to facilitate extraction and **incubate 5 minutes** at ambient temperature **keeping the swab tip immersed in the elution buffer.** It has to be noticed that **longer elution times are allowed** and should enhance the test sensitivity.



4. Remove the swab from the soft test tube and discard. When removing the swab, press on the swab tip to recover the maximum liquid volume from it.



5. Open the storage tube to take a dipstick.

When opening the strip tubes, close immediately and tightly the tube to protect the remaining strips from humidity



100%



Page 3

6. Add a strip in the soft test tube containing the swab eluate. **Make sure that the two red arrows are pointing down** (see pictures in section "test procedure description" Once immersed, the eluate liquid level should not exceed the red line below the red arrows.



7. Allow the test to **develop** for up to **10-15 minutes**.

If both band (test and control line) are clearly visible before 10 minutes, further incubation is not required.

To ensure correct performance of the test, the dipstick must remain in vertical position after being in contact with the sample, and during all the migration/reaction step.

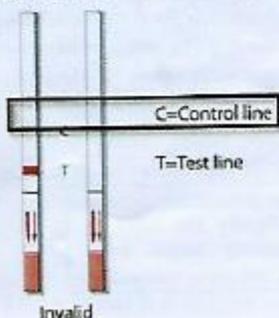


You can use the cardboard rack –or any other adapted device– for that purpose.

## Validation

The test is **validated** and can be **interpreted** only if there is a visible red band on the control (C) line.

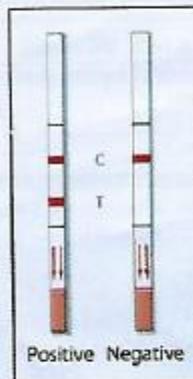
If the band is not visible on the control line, as in the example below, the test is invalid and should be repeated.



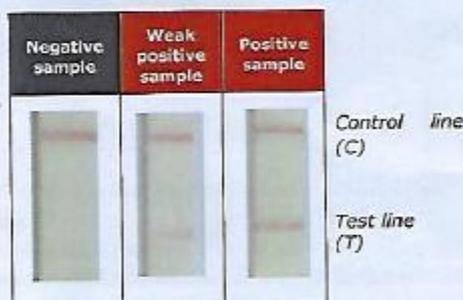
## Interpretation

The test is considered as (see illustration below):

- ✓ **NEGATIVE** if no red band is visible on the test line
- ✓ **POSITIVE** if a red band, is visible on the test line



Note : even a weak red band is considered as a **POSITIVE** result ; see examples below.



## Troubleshooting

If no signal is visible on the Control line, this may either be because:

- the test device was faulty (see section Precautions – protection from prolonged exposure to humidity)
- the sample contained particulate material that blocked the flow of buffer
- the sample was not applied correctly to the sample application pad on the dipstick (see Protocol step 6 ; take care of the red-arrows position)
- insufficient volume of swab eluate to perform full migration : if so, repeat sampling with a new swab, elution. If necessary, add few more drops (max 20 drops) of elution buffer before performing the test. The liquid level should not exceed the red line. See protocol step 5.

## **Annex 10: Outbreak investigation form with clinical examination table**

*Printable version below.*

## Outbreak Investigation Form

Name(s) of investigator(s)				
Owner name		Main informants (#)	Men	Women
Village		Date of investigation		
Ward		GPS Coordinates: latitude		
District		GPS Coordinates: longitude		

1. Date of onset of first case	
--------------------------------	--

2. Animals affected	Goats		Sheep		Remarks about types of animals affected e.g. sex, breed, etc.
	Young <12 months	Adult >12 months	Young <12 months	Adult >12 months	
No. of animals that have been sick (including those that died)					
No. of animals that have died					
Total no. in flock (sick and healthy)					

Clinical signs	Goats			Sheep		
3a. Clinical signs (as described by livestock keeper)						
3b. Post mortem signs (as described by the livestock keeper)						
3c. Number of abortions since the outbreak started?						
	Goats			Sheep		
	Yes	No	Don't know	Yes	No	Don't know
Has there been a decrease in milk production?						
Has there been a reduction in body condition or growth?						
Has the disease caused a drop-in market value of the animals?						
Has the disease prevented you from trading animals?						

4a. What local name do you call this disease?	
4b. What does this name mean?	
4c. What do you think causes this disease?	

5a. Have you seen this disease before in your flock?	
5b. When?	

6a. Are any other flocks in the area affected? (how many flocks? In which location(s)?)	
---	--

7a. What treatment or control measures have you applied?	
7b. What effect did you observe?	

8a. Has the flock been vaccinated against PPR?	Yes	When?	(date)	By whom?	Privately	How much did you pay per animal?	
	No				Government		
9a. What other diseases has the flock been vaccinated against?	Name of disease (1)	When?	(date)	By whom?	Privately	How much did you pay per animal?	
					Government		
	Name of disease (2)	When?	(date)	By whom?	Privately	How much did you pay per animal?	
					Government		
	Name of disease (3)	When?	(date)	By whom?	Privately	How much did you pay per animal?	
					Government		

9. What other disease problems have you seen in the flock in the past one year?				
Local name	Meaning of name	Main clinical signs	How many affected (including those that died)	How many died

10. Does your flock have contact with other flocks?	At pasture	Watering place	Other (describe)
---	------------	----------------	------------------

11a. How long has your flock been in this location?	
11b. If the flock moved in the past year, when, where and why was it moved?	

12a. Did you buy any other sheep or goats in the month before the disease started?	
12b. Did you treat or vaccinate the new animals before introduction into the herd?	
12c. Did you take your sheep or goats to the market that were unsold and returned to the flock in the one month before the disease started?	
12d. Have any animals entered the flock for any other reasons (e.g. gifts, loans) in the one month before the disease started?	

15. Any other remarks	
-----------------------	--



## Annex 11. Estimating age by dentition

With the livestock keeper restraining the sheep or goat, gently pull down the lower lip and raise the upper lip to be able to view the lower set of incisors. Check how many incisor teeth are present and their size. Young animals aged less than 12 months will have small temporary incisor teeth. Between the ages of 12-18 months, the first set of permanent incisors erupts to replace the middle two temporary teeth. The second pair erupt at about 18-24 months of age, the third pair at 24-36 months and the fourth pair at over 3 years of age. See the diagrams below showing one, two, three and four pairs of permanent incisors.



Photos: Bryony Jones

One pair	Two pairs	Three pairs	Four pairs
1 to 1.5 years	1.5 to 2 years	2 to 3 years	More than 3 years

## **Annex 12: Market survey A - Key informant interview**

*Note: This tool is programmed for digital administration with ODK. This guide is for reference only.*

*Printable version below.*

## Key informant interview and market observations

Name of interviewer(s)			
Interview location		Name of market	
Date of interview:		Type of market	<i>Primary /secondary/ tertiary</i>
Position/ role			
Respondent gender	<i>Male/female</i>		

1. For the sheep and goats being sold in this market, which areas do they come from? (Give the names and types of places that they come from. If markets are mentioned, ask for the type of market – primary/secondary/tertiary)

2. For the sheep and goats that are bought in this market, which places are they taken to? (Give the names and types of places. If markets are mentioned, ask for the type of market – primary/secondary/tertiary)

3. Approximately how many sheep and how many goats are sold each market day?



## Annex 13: Market survey B - Market observations

While conducting the interviews in the market, the research team should record their observations on the number of small ruminants in the market, the condition of the animals, presence of sick animals and any other observations on the characteristics of the market.

Name of interviewer(s)			
Interview location		Name of market	
Date of Interview:		Type of market	<i>Primary /secondary/ tertiary</i>

1. Estimated number of small ruminants in the market (based on direct observation)

	Sheep	Goats
Immature (<1 year old)		
Adults (>1 year old)		

### Animal observations

2. Observations on body condition

3. Did you observe any sick small ruminants in the market? (give details of numbers and clinical signs)

4. Any other remarks:

## Information sheet 1: Key informant interviews

This research project, which will run from 2019 to 2022, aims to provide key information on the epidemiology of PPR to support ongoing national and global efforts to control and eradicate PPR. The project's research partners are the National Livestock Research Institute, the Directorate of Veterinary Services, public and private veterinarians and all stakeholders in the value chain of small ruminants. Participants to this study have been selected by the investigators with help from the partners and local veterinary services. The purpose of this research is to gain a clear understanding of the epidemiology of PPR, vaccination strategy and impacts in livelihood for livestock keepers, traders and consumers. The achievement of this objective requires consultation with all value chain actors including you (veterinarians, veterinary drug distributors, drug stockists and governments authorities). We will ask you information about animal health service delivery, main small ruminants disease problems. PPR interventions, PPR Vaccine value chain and main markets and trade routes.

Completion of the work will guide subsequent control of PPR in the country and beyond. Participation to the study is voluntary and you can withdraw from the study at any time. Benefits of participation include increasing knowledge of small ruminant disease management and helping community to identify ways to improve the control of the disease.

There are no significant risks in participating except for sharing of basic personal information. The data collected during this study will be in the form of paper or electronic data collection forms. Only the lead investigators will keep hard copies of the forms. Digital copies of the data will be kept securely by the project leader. All data and any personal information of interviewees (names and contact details) will be kept on secure computers belonging to the national research organization or ILRI. Results of the study and anonymized data will be made publicly available through feedback to communities and local authorities, project reports, and policy briefs.

For further details on this study contact the lead supervisor or the Country coordinator.

Lead supervisor		Country coordinator	
Telephone		Telephone	
e-mail		e-mail	
Postal address		Postal address	

## Information sheet 2: Community meeting

This research project, which will run from 2019 to 2022, aims to provide key information on the epidemiology of PPR to support ongoing national and global efforts to control and eradicate PPR. The project's research partners are the National Livestock Research Laboratories, Directorate of Veterinary Services, public and private veterinarians and all stakeholders of the small ruminant's value chains. Participants to this study have been selected by the investigators with help from the partners and local veterinary services. The purpose of this research is to gain a clear understanding of the epidemiology of PPR and its impacts in livelihood for livestock keepers, traders and consumers. The achievement of this objective requires consultation with all value chain actors including you (livestock keeper), as well as stakeholder such as veterinarians, veterinary drug distributors, drug stockists and governments authorities. We will ask you information about common small ruminants' diseases, history of PPR and current diseases in your area; PPR control measures put in place by you or others and their level of success; the impact of PPR on your farm and livelihood of communities; and livestock movement and trade in your community and surrounding

Completion of the work will guide subsequent control of PPR in the country and beyond. Participation to the study is voluntary and you can withdraw from the study at any time. Benefits of participation include increasing knowledge of small ruminant disease management and helping community to identify ways to improve the control of the disease. If there is any livestock disease related issue raised during the meeting, we will provide advice or help you reach the technical relevant person.

There are no significant risks in participating except for sharing of basic personal information. The data collected during this study will be in the form of paper or electronic data collection forms. Only the lead investigators will keep hard copies of the forms. Digital copies of the data will be kept securely by the project leader. All data and any personal information of interviewees (names and contact details) will be kept on secure computers belonging to the national research organization or ILRI. Results of the study and anonymized data will be made publicly available through feedback to communities and local authorities, project reports and policy briefs.

For further details on this study contact the lead supervisor or the Country coordinator.

Lead supervisor		Country coordinator	
Telephone		Telephone	
e-mail		e-mail	
Postal address		Postal address	

### Information sheet 3: Household survey

This research project, which will run from 2019 to 2022, aims to provide key information on the epidemiology of PPR to support ongoing national and global efforts to control and eradicate PPR. The project's research partners are the National Livestock Research Institute, the Directorate of Veterinary Services, public and private veterinarians and all stakeholders in the value chain of small ruminants. Participants in this study have been selected by the investigators with help from the partners and local veterinary services. The purpose of this research is to gain a clear understanding of the epidemiology of PPR and its impacts on the livelihoods of livestock keepers, traders and consumers. The achievement of this objective requires consultation with all value chain actors including you (the livestock keeper), as well as stakeholders such as veterinarians, veterinary drug distributors, drug stockists and governments authorities.

We will ask you to provide information about small ruminant production system, management, movements, common diseases, PPR impact, control measures including vaccination strategy and treatment. We will also have a look at your herd to see approximately how many animals you keep, and to see if there are animals with signs of disease.

Completion of the work will guide subsequent control of PPR in the country and beyond. Participation in the study is voluntary and you can withdraw from the study at any time. The benefits of participation include improved knowledge of small ruminant disease management and helping the community to identify ways to improve the control of the disease. If there is a sick animal in your farm during the visit, the researcher will help you manage the case if he or she is a vet, or will help you to reach relevant technical people.

There are no significant risks in participating except for sharing of basic personal information. The data collected during this study will be in the form of paper or electronic data collection forms. Only the lead investigators will keep hard copies of the forms. Digital copies of the data will be kept securely by the project leader. All data and any personal information of interviewees (names and contact details) will be kept on secure computers belonging to the national research organization or ILRI. Results of the study and anonymized data will be made publicly available through feedback to communities and local authorities, as project reports and policy briefs.

For further details on this study contact the lead supervisor or the Country coordinator.

Lead supervisor		Country coordinator	
Telephone		Telephone	
e-mail		e-mail	
Postal address		Postal address	

## Information Sheet 4: Market survey A - Key informant interview

This research project aims to collect information on the epidemiology, impact and control of PPR to support national and global efforts to control and eradicate PPR, by consulting with all the different types of people involved with sheep and goat production. An important part of sheep and goat production is the marketing of live animals. We are therefore visiting major sheep and goat markets and conducting interviews with key informants who are knowledgeable about the market, and with individual traders and livestock keepers who are buying and selling animals in the market.

As a key informant, we would like to ask you about the general characteristics of the market, such as the size of the market and where the animals come from, and where they go to after leaving the market. Your participation will contribute valuable information to build up a good picture of the small ruminant marketing system in this country.

Participation in the study is voluntary and you are free to withdraw at any time. There are no significant risks in participating except for sharing of basic personal details. The data will be collected on written forms or electronic forms, which will be kept securely by the project leader. The anonymized data and results of the study will be made publicly available through feedback to communities and local authorities in project reports and policy briefs.

The project partners are ILRI, the National Livestock Research Institute and the Directorate of Veterinary Services. The project runs from 2019 to 2022.

For further details on this study, contact the lead supervisor or the Country coordinator:

Lead Supervisor		Country coordinator	
Telephone		Telephone	
e-mail		e-mail	
Postal address		Postal address	

## Information Sheet 5: Market survey C - Questionnaire with buyers and sellers

This research project aims to collect information on sheep and goat farming and trade to support efforts to control major diseases. We are consulting with all the different people involved with sheep and goat production. An important part of sheep and goat production is the marketing of live animals. We are therefore visiting major sheep and goat markets and conducting interviews with livestock keepers and traders.

As someone who is buying or selling sheep and goats, we would like to ask you about where the animals have come from or are going to, what other markets you visit, and the main disease problems that you face. Your participation will contribute valuable information to build up a good picture of the small ruminant marketing system in this country.

Participation in the study is voluntary and you are free to withdraw at any time. There are no significant risks in participating. The data will be kept securely by the project leader, and anonymized data and results will be made publicly available through feedback to communities and local authorities in project reports and policy briefs.

Project partners: ILRI, National Livestock Research Institute, Directorate of Veterinary Services. Project timeframe: 2019 to 2022.

For further details on this study, contact the lead supervisor or the Country coordinator:

Lead Supervisor		Country coordinator	
Telephone		Telephone	
e-mail		e-mail	
Postal address		Postal address	

## **Information sheet 6: PDS/Outbreak investigation**

This research project, which will run from 2019 to 2022, aims to provide key information on the epidemiology of PPR to support ongoing national and global efforts to control and eradicate PPR. The project's research partners are the National Livestock Research Laboratories, Directorate of Veterinary Services, public and private veterinarians and all stakeholders of the small ruminant value chains. Participants in this study have been selected by the investigators with help from the partners and local veterinary services. The purpose of this research is to gain a clear understanding of the epidemiology of PPR and its impacts on livelihoods for livestock keepers, traders and consumers. The achievement of this objective requires consultation with all value chain actors including you (the livestock keeper), as well as stakeholders such as veterinarians, veterinary drug distributors, drug stockists and governments authorities. The aim of this meeting or farm visit is to determine whether PPR disease is present in your area, and to describe the history and pattern of PPR disease occurrence in the area. We will ask you information about PPR outbreaks in your community. Suspected PPR outbreaks will be recorded and samples of blood, tears, nose discharge and saliva will be collected from a few sick animals in those herds.

Compensation / indemnity that matches the losses following case of adverse effects will be provided. For ethical reasons, for severely sick sheep and goats (those that are recumbent and/or not eating and drinking for at least 3 days), we will request you to allow us to euthanize the animal, and you will be compensated at a mutually agreed market value/price. After necropsy, the carcass will be disposed of by deep burial or incineration, according to the Animal Diseases Act, 2000.

Completion of the work will guide the subsequent control of PPR in the country and beyond. Participation in the study is voluntary and you can withdraw from the study at any time. The benefits of participation include improved knowledge of small ruminant disease management and helping the community to identify ways to improve the control of the disease. If there is any livestock disease related issue raised during the meeting or visit, we will provide advice or help you reach the relevant technical person.

There are no significant risks in participating in this study except for sharing of basic personal information. The data collected during this study will be in the form of paper or electronic data collection forms. Only the lead investigators will keep hard copies of the forms. Digital copies of the data will be kept securely by the project leader. All data and any personal information of interviewees (names and contact details) will be kept on secure computers belonging to the national research organization or ILRI. The results of the study and anonymized data will be made publicly available through feedback to communities and local authorities, as project reports and policy briefs.

For further details on this study contact the lead supervisor or the Country coordinator.

Lead supervisor		Country coordinator	
Telephone		Telephone	
e-mail		e-mail	
Postal address		Postal address	

## **Information sheet 7: Flock dynamics**

This research project, which will run from 2019 to 2022, aims to provide key information on the epidemiology of PPR to support ongoing national and global efforts to control and eradicate PPR. The project's research partners are the National Livestock Research Institutes, the Directorate of Veterinary Services, public and private veterinarians and all stakeholders in the value chain of small ruminants. Participants in this study have been selected by the investigators with help from the partners and local veterinary services. The purpose of this research is to gain a clear understanding of the epidemiology of PPR and its impacts on livelihoods for livestock keepers, traders and consumers. The achievement of this objective requires consultation with all value chain actors including you (the livestock keeper), as well as stakeholders such as veterinarians, veterinary drug distributors, drug stockists and governments authorities. Completion of the work will guide the subsequent control of PPR in the country and beyond.

During this questionnaire we will ask you questions about your small ruminant herd, specifically about births, deaths and animals entering and leaving your herd. We aim to collect this information every month over a one-year period.

Participation in this study is totally voluntary and you can withdraw from the study at any time. The benefits of participation include improved knowledge of small ruminant disease management and helping communities to identify ways to improve the control of the PPR. The farms that will be monitored will benefit from free treatment and advice in case any disease occurs during a farm visit.

Compensation / indemnity that matches the losses following a case of adverse effects will be provided. For ethical reasons, for severely sick sheep or goats (those that are recumbent and/or not eating and drinking for at least 3 days), we will request you to allow us to euthanize the animal, and you will be compensated at a mutually agreed market value/price. After necropsy, the carcass will be disposed of by deep burial or incineration, according to the Animal Diseases Act, 2000.

There are no significant risks in participating in this project except for sharing of basic personal information. The data collected during this study will be in the form of paper or electronic data collection forms. Only the lead investigators will keep hard copies of the forms. Digital copies of the data will be kept securely by the project leader. All data and any personal information of interviewees (names and contact details) will be kept on secure computers belonging to the national research organization or ILRI. The results of the study and anonymized data will be made publicly available through feedback to communities and local authorities, as project reports and policy briefs.

For further details on this study contact the lead supervisor or the Country coordinator.

Lead supervisor		Country coordinator	
Telephone		Telephone	
e-mail		e-mail	
Postal address		Postal address	