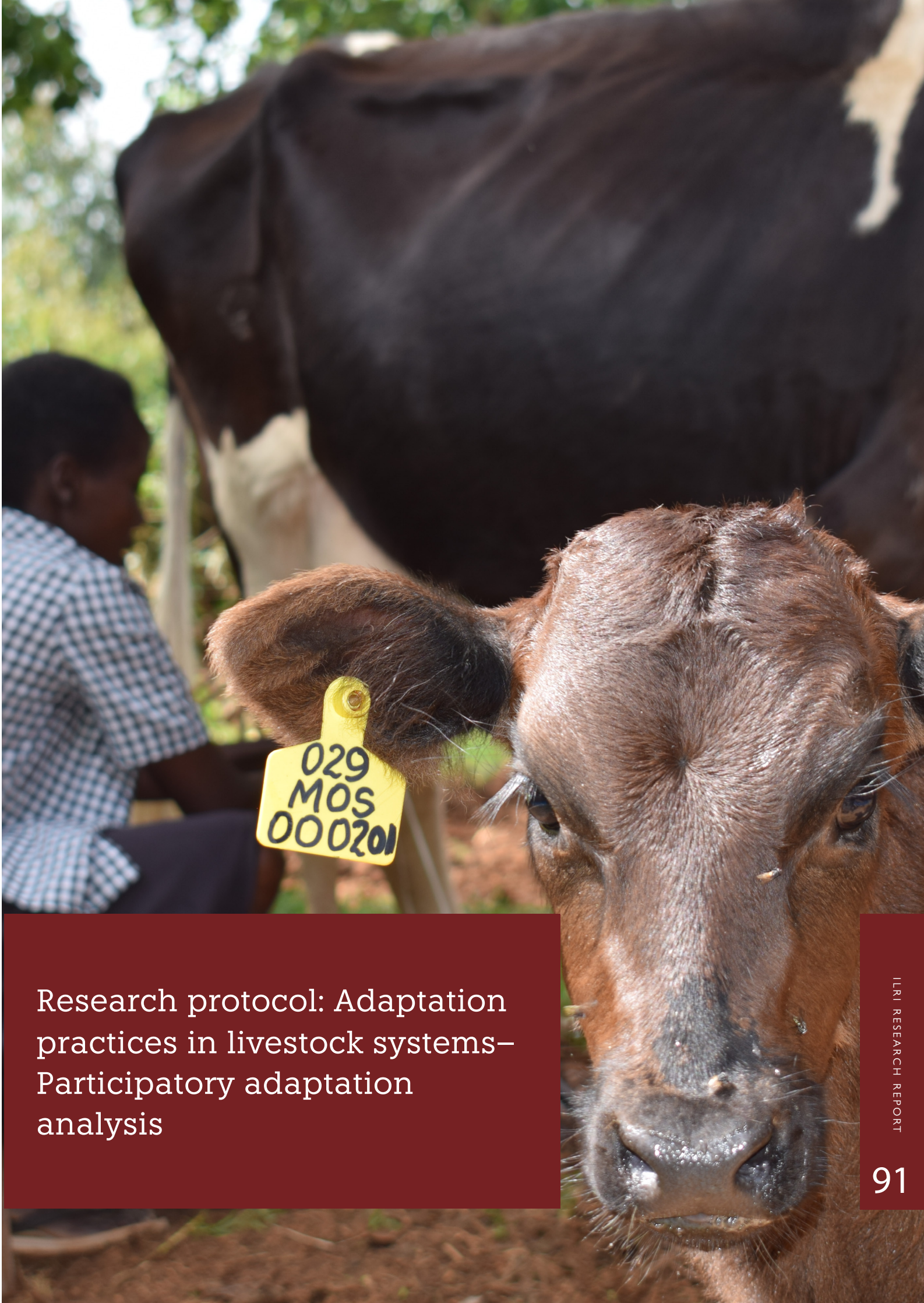

Research protocol: Adaptation practices in livestock systems– Participatory adaptation analysis

ILRI RESEARCH REPORT
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Research protocol: Adaptation practices in livestock systems– Participatory adaptation analysis

Birgit Habermann, Todd Crane, Tigist Worku, Leah Gichuki and Roland Mugumya

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Rationale

Much research looks at the effects of climate change and potentially correlated common agricultural practices across local livestock keepers[1] . The adoption of such agricultural practices could be defined as an adaptation strategy, but equally, it could be related to other drivers of change and innovation, such as overall environmental factors (e.g., deforestation), economic factors (e.g., markets becoming available), social processes (e.g. migration of youth due to shortage of land reducing available on-farm labour), or other related factors. Likewise, whether an adaptation practice is successful or not depends on more than technical aspects: adaptation practices need to be equally effective regarding the social needs of those performing them (Crane et al. 2011). In a scoping study on adaptation, we identified a range of adaptation practices at five sites in Ethiopia, Kenya, and Uganda (Habermann et al. 2021b). With the Participatory Adaptation Analysis, we wanted to explore these further to understand which 'prototypes' worked more effectively than others to help local livestock keepers adapt to climate change.

1 We speak of 'local livestock keepers' rather than 'farmers', as our field sites encompass a variety of land uses from mixed crop/livestock farming to intensive dairy farming, and from agro-pastoralism to pastoralism.

Pioneers of adaptation

We used the concept of positive deviance in our scoping study on adaptation (Habermann et al. 2021b). It enabled us to get a more in-depth understanding of pioneers' decisions on adoption, continuation, or re-configuration of adaptation practices in response to perceived effects of climate change. Originating in health and nutrition research, positive deviance is an approach that focuses on resilience: rather than identifying failure and analysing problems, positive deviance leads us to understand why 'some people exhibit good outcomes "against the odds"' (Lapping et al. 2016: 129).

Building on this research, we then developed the concept of the adaptation pioneer. First results from interviewing local livestock keepers indicated that many of them were pioneers (called 'innovators' in the scoping study) rather than mere adopters. We are aware that in our understanding, pioneers can sometimes be mixed up with 'celebrity show farmers' (Flachs 2017). However, when we looked for pioneers, we did not look for farmers who represented the village or the community in question – in our understanding there is a difference between pioneers and show farmers, who 'are not, in this sense, naturally superior, but are sustained by a thick social network of expertise and support' (Flachs 2017, p. 31). We were trying to distinguish those who obediently adopted technologies promoted and supported by governments, research, and NGOs from those who actively and on their own initiative came up with improvements for technologies and experimented with various technologies on their farms with the aim of improving productivity and creating more sustainable livelihoods in the context of climate change. Whether we defined technologies implemented as new and innovative or not, depended on the context.

A common reason for farmers to potentially adopt a new approach is latent motivations: 'The self-sufficient pioneer may adopt only if the practice is believed to be novel and connected with potential broader livelihood improvements, despite the perceived risks. He sees no need for external economic incentives to experiment.' (Zabala et al. 2017: 240-241). Our initial findings indicated that adaptation pioneers frequently defined themselves as different from others, as thinking out of the box, and as taking risks others were not willing to take (Habermann et al. 2021a).

While there were substantial differences between the five sites, there were also some common threads in the self-perception of adaptation pioneers. We would like to explore these further to understand what it was that enabled some livestock keepers to be successful in adapting to climate change, while so many others failed. We defined adaptation pioneers to be livestock keepers with the motivation required to be able to respond to the changes in their environment caused by climate change. We decided on this definition because 1) these pioneers were successful under the same circumstances as others (positive deviants), 2) they were acting in response to climate change (adaptation). This was important because we were looking into cases in the context of climate change, where specific personal situations, life choices or curiosity, have motivated and enabled farmers/pastoralists to become adaptation pioneers.

Problem statement

We wanted to understand what made adaptation successful, especially adaptation that originated in producers' socio-technical spaces rather than in technology push/adoption models. Therefore, we wanted to highlight socio-technical processes around the emergence of adaptation practices, their performance and socio-technical effectiveness, and the motivations of adaptation pioneers to understand what made them different from early adopters.

Research questions

1. What are the factors contributing to the emergence of local innovations in relation to climate change adaptation?
2. How do adaptation practices perform under different socio-technical settings in East African livestock systems?
3. How can participatory research advance through collaboration with pioneers rather than adopters?

Overview on methods

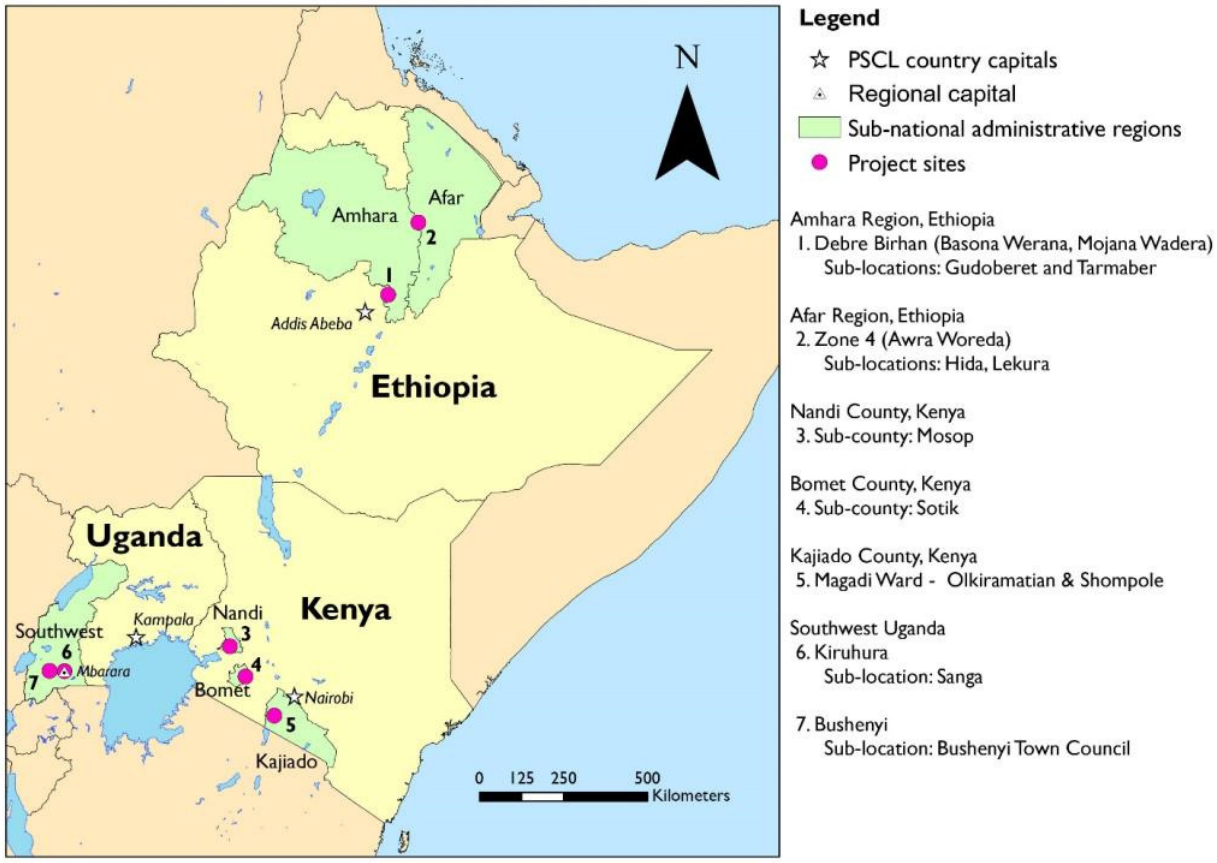
The methods described in detail in this research protocol are:

- **Semi-structured interviews** including introduction and informed consent, and agreement on confidentiality and intellectual property rights for local livestock keepers' innovations.
    - Exploring for socio-technical developments
    - Life histories
    - Observation of adaptation practices, exchange about upcoming issues
- Pioneers applying **citizen science**
    - Record sheet to be maintained by locals, measurements, and sampling
    - Involvement in analysis and presentation of results
    - Mapping out participatory assessment and facilitation of farmers' engagement (process documentation)
- **F2F field days**: This program was carried out by the pioneers themselves with assistance from researchers, in addition to the involvement of a partner organisation or the extension service.
    - Experience exchange, training, Q&A, and more
    - Passing experiences on to others, motivating others
    - Documenting the response of others to the endeavours of the pioneer
- **Final workshops**
    - World café, group discussions
    - Triangulation and dissemination of results

Site selection

The sites were previously selected during the scoping study (Habermann et al. 2021b). The only difference between the sites in the scoping study (see Figure 1) and in this in-depth study was site number 7, Bushenyi. This site was not included in this phase of the research because there were insufficient indicators that climate change was an important driver there as compared to the other sites.

Figure 1: Map indicating the location of the different sites of the Program for Climate-smart Livestock (PCSL) (Michael Graham/ ILRI).



On-site participatory adaptation analysis

Sample selection: At this stage, we already had a list of names based on the results of the scoping study. Based on this list the final number of 'pioneers of adaptation' for an in-depth study was selected.

Output:

- Documentation of one year's progress in terms of household's livestock diversity, market orientation, off-farm income, resource requirements, attendance of training, accessing of different sources of information, consultation of extension, and other factors
- Effect on male/female/young household members in terms of labour, social implications, income situation, nutrition, and more
- Impact on productivity and profitability: Overall economic changes and impact of economic changes (use of income)
- Impact on social capital (changes in social networks, etc.)

Method I: Selecting and interviewing innovators and observation

The sample was based on the results of the adaptation scoping study. In that study, 15 to 20 local livestock keepers were interviewed in depth at each site during on-site visits. Based on the analysis of the interviews, up to eight pioneers were selected from each site for the participatory adaptation analysis.

The shortlist for the innovators was compiled by the main investigator and then cross-checked by the site coordinator. The criteria for selection from the scoping study interviews were:

- Awareness of climate change
- Implementation of an adaptation practice in response to climate change
- Pioneering character of the head of household (male or female)

Based on this assessment, a shortlist of 8 to 10 pioneers per site was compiled using a scoring system of 1 – 5. Average scores were used for ranking. This was cross-checked between the main investigator and the site coordinators. The pioneers on the shortlist were then interviewed during the first field visit in scoping interviews to facilitate selection of the final participants for the in-depth study (see Guidelines for first visit: Scoping interview):

- **Scoping interviews:** These included introduction and informed consent as well as agreement on confidentiality and intellectual property rights for local livestock keepers' innovations (see Informed Consent). If the selected sample was too small because some farmers/pastoralists were not available, no longer practicing the identified adaptation practice, or unwilling to participate, then the next innovators in the ranking were interviewed.
    - Sample size: 8 to 10 pioneers per site (in total)
    - Updating information gathered during the original scoping study
    - Assessing:
        - Willingness to engage in participatory adaptation analysis
        - Willingness and known ability to share knowledge with others (the latter to be cross-checked with other key stakeholders on site)
        - Willingness to hold field days
- **Semi-structured interview** (see Semi-structured interview guidelines Visit I) with the participants of the in-depth study identified as 'pioneers of adaptation' at the beginning, in the middle, and at the end of the 12-month period of data collection. The first semi-structured interview followed the Semi-structured interview guidelines Visit I. The second and final interviews were unstructured, and merely served to fill gaps or clarify, and to assess how the pioneers perceived the research process. The questions were specific to each pioneer and prepared based on previous interviews, field days, and monthly data collection.
    - Sample size: Five to eight pioneers per site
    - Exploration for socio-technical developments
    - Collection of life histories
    - Recording observations on adaptation practices (using Contact Summary Form), exchange about upcoming issues

Deliverables:

- Signed informed consent of respondents
- Socio-economic details on respondents and coding list for respondents
- Updated resource map

- Transcription and English translation of recorded interviews
- Original recordings (named according to guidelines with the code of the respondent, not the actual name)
- Transcript of the recordings and observation notes in final formatting (see Template for Transcripts)
- Contact forms (see Contact Summary Form)
- Signed photograph consent of respondents (see ILRI consent form: Photography use for human subjects)
- Photographs (documented with codes of respondents)
- Deliverables formatted according to the templates provided

Method II: Pioneers applying citizen science

- Sample size: Five to eight pioneers per site
- Training of pioneers in record-keeping
- Maintenance of record sheet by pioneers and collection on a monthly basis, e.g. milk records
- Monthly data collection with Open Data KitTM (ODK): questionnaire filled in by pioneer and research assistant together, either through a visit or over the phone (see example ODK Form – Example of Debre Birhan [all forms were adapted to the specific site])
- Taking of observation notes (see Contact Summary Form)
- Involvement in analysis and presentation of results

Material and input required:

- Compensation for livestock owners' time and input in terms of 'incentives' such as feed packages, dewormers, or acaricides, depending on the site: this had to be negotiated at the beginning and coordinated with others working in the area, to avoid creating wrong precedents. However, whatever was agreed upon had to be kept to and delivered to maintain trust between the pioneers and the researchers from outside.
- Field materials:
    - Tablets for ODK survey
    - Digital recorders and notebooks
    - Smartphone for taking photographs
- Internet connectivity
- Materials for measuring:
    - Heart girth (cattle)
    - Weight (small ruminants)
    - Milk and feed samples, milk record-keeping. In this case, milk sampling was not done because there was no possibility of doing analysis with a lactoscan on site. However, the necessary materials are listed below.
    - Number of livestock (ear tags)

If livestock owners were not comfortable with ear-tagging, the best alternative method was to take photographs of the livestock.

Item	Description	Quantity for 6 households
Ear tags	10 tags per household	60
Ear tag applicator	Only used when tagging livestock	3
Cotton wool for disinfecting when ear-tagging		as needed
Marker pen for ear tags		2
Menthylated spirit	500 ml	6
Heart girth tape	Rondo tape	6
Khaki bags	Size 8	12 dozen
Spring scale and sling for weighing		6
Notebook for farmers for record-keeping		6
Mazicans (locally known standardzed containers for measuring milk)	Measuring milk	6
Kitchen scale	Weighing samples	2
Scissors for grass cutting		6
In case of milk sampling:		
Milk sampling bottles	60 ml	6 dozen
Cooler box	Milk sample transport	2
Coolpacks for the milk cooling		as needed

Deliverables:

- Record sheets for selected adaptation practice filled in at previously agreed intervals, collected monthly (ODK, or if not possible use paper-based forms)
- Data entered according to respondent coding list
- Ear tag /animal ID registration
- Milk records, milk samples, if applicable
- Feed sampling sheets and feed samples, if applicable
- Other on-farm records relevant for the adaptation practice
- Transcript of the notes on informal conversations/ observation notes in final formatting
- Photographs (documented with respondent codes)
- Deliverables formatted according to the templates provided

Farmer-to-farmer field days

Sample selection: Local livestock keepers were invited by the pioneers. They were people who expressed an interest in learning about the adaptation practices implemented by the pioneers. The event was organised in discussion with extension agents, the pioneer, and local key stakeholders. The nature of this event was like a farmer-to-farmer (F2F) training event, but it was shaped individually by the respective livestock keepers organising it. The field days took place in very small groups, with only about 10 participants.

The preparation for the field day was very important. The research assistants prepared together with the pioneers in ongoing discussions. The pioneers selected topics they were interested in demonstrating and it had to be clear in advance what and how they were going to demonstrate. Ideally, the research assistants went through a mock interview with them, or a dry run of the entire field day. It was an unusual situation for many pioneers to be the expert and the one doing the talking, without external experts interfering. Thus, they needed a lot of encouragement and support, in some places more than in others, and careful planning. To better understand the process, we interviewed the pioneers as well as their groups immediately after the field day.

We had planned two field days for each innovator during this data collection period. The first one took place at about six months into data collection. The second one was towards the end. While at the first field day, the pioneers mostly talked about what they were doing at the time, the second field day allowed them to reflect on their achievements (but also the lessons learned when looking at the data that we had collected during the year) and to provide answers to open questions. If applicable, an external expert was invited to answer questions of both pioneers and participants. Optionally, such field days can also serve to bring all pioneers together in one place.

Criteria for inviting participants to field days:

- Known interest in the presented adaptation practices
- Potential to pass knowledge on to others (F2F training)
- Basic preconditions in place (land and livestock, labour, minimum economic assets)
- Minimum pioneering spirit and known to be willing to try out new things, resiliency and innovativeness, innovators rather than obedient adopters
- Not immediate family members of the innovator (because this exchange should happen without our support)
- Ideally, he or she had already tried to implement the adaptation practice but had not been so successful and was now willing to improve its implementation in another attempt

Output:

- Experience exchange, training, Q&A
- Sharing of experiences with others, motivation of others
- Documentation of the response of others to the endeavours of the pioneer (notes, participatory video if applicable, photographs)
- Observation notes (using Contact Summary Form – Field Days)

Method:

The program was carried out by the pioneers themselves with assistance of the research team, plus the involvement of a partner organisation or the extension service, if applicable (see Guidelines for Documentation of Field Days). To assess how the field days went, we did group interviews with the participants (groups of five only), and a semi-structured interview with the host pioneer. After some time had passed, participants were contacted to find out if they had been able to make use of what they had learned on the field day (F2F demonstration and learning days in PCSL: Follow-up questions).

Deliverables:

- Program for field day
- Attendance sheets
- Written report in English, with photographs, observation notes (using contact forms, see Contact Summary Form – Field Days)
- Interview with pioneer and with the group, transcribed into English (see Guidelines for Documentation of Field Days)
- Signed photograph consent of participants (see ILRI consent form: Photography use for human subjects)
- Photographs of event
- Group interviews and interviews with organising pioneers

- Participatory video (if applicable)

Training

As part of the program, we also offered tailor-made trainings to the pioneers. These were on-demand and really adjusted to their needs. It was important to make it clear to the trainers, that they were training farmers and should focus on what was best for this target group. Thus, the training had to be practical, with demonstrations, and only a very minimal theoretical input, avoiding lengthy power point presentations. The trainings were one to two days. The ideal location was a local research centre, but it could also take place on a farm of one of the pioneers, for example. To understand how well the training had met the pioneers' expectations, evaluation was important. We designed an evaluation sheet that could also be used by illiterate farmers (see Pioneer Training Evaluation Sheets: Example of Debre Birhan).

Deliverables:

- Program for training
- Attendance sheets
- Written report in English with photographs and observation notes (using Contact Summary Form)
- Evaluation sheets
- Photographs of event

Feedback workshop

The purpose of the feedback workshop was to present the findings of the scoping study and the participatory adaptation analysis to an audience like that of the first workshop of the scoping study, but this time together with the pioneers. The idea was to show what had been done so far in the project and what the preliminary results were and propose follow-up actions and future plans. Participatory videos could be shown and disseminated at the workshops, if applicable.

Participants:

- Key resource persons including village leaders (elders, clan leaders), district staff responsible for livestock issues, community development staff, government experts at different levels
- Male local livestock keepers, if applicable divided into a group of young (possibly landless) and a group of unmarried youth, and married, middle-aged landowners
- Female local livestock keepers, if applicable divided between female-headed households and others
- Local livestock keepers known for high competency in adaptation for livestock

Other possible criteria could be landowners/tenants, wealthy/poor (e.g., in terms of livestock, based on number of livestock or on type of livestock, e.g., ownership of crossbreeds), or old residents/new settlers.

Program:

- Introduction of team and participants
- Presentation of results and activities to date
- Obtaining of informed consent and consent for recording, if applicable
- Formation of groups of ca 5-10 participants for discussion (using the World Café methodology). We ensured that the participants were comfortable being lumped into a group; however, it is advisable to have separate groups for men and women.

Deliverables:

- Workshop program
- Attendance sheets
- Translated and transcribed recordings
- Report on workshop discussions and group work
- Photographs (and videos) of event
- Blog

Data collection, documentation, and analysis

Secondary sources, interview transcripts, and observation notes were coded and analysed with qualitative data analysis methods according to Bernard (2002) and Miles and Hubermann (1994). The software program NVIVO was used for the analysis. Visual material was digitalised and included in coding. Quantitative data were analysed in STATA.

Managing and storing data

This section is similar to that covering the same topic in the scoping study (Habermann et al. 2021b) and was only slightly adapted. We had to consider the possibility that the people analysing the data would not be the same as those doing the data collection (Johnson et al. 2010). Therefore, the team had to follow a clear and coherent system for managing and storing data. For each site a supervisor was appointed who was in charge of collecting the data from the first-hand data collectors. This supervisor was responsible for ensuring adherence to a coherent filing system as well as completeness of the required data according to the list of deliverables (see List of Deliverables), which had to be updated monthly. At the outset, before starting data collection, this required a detailed discussion with the data collectors on how to document and submit files.

STEP 1: A nomenclature for file naming and a template that outlined which information had to be captured for each item were shared. All data record sheets and transcripts required the following information:

- Name of interviewer, name of transcriber (if different from data collector)
- Code for respondent
- Place, date, duration, and time of interview
- Program used for transcriptions
- Original language of interview
- Type of interview (key informant, pioneer, group discussion)

Example:

- Name of interviewer: Birgit Habermann, interview transcribed by Tigist Worku
- Code for respondent: ETH-DB-KI-1
- Place, date, duration and time of interview: Debre Birhan, 15.10.2019, 35 min, 10:15 am.
- Program used for transcription: Express Scribe
- Original language of interview: English

- Type of interview (key informant, pioneer, group discussion): Key informant interview

The file names followed the same coding system as the scoping study (Habermann et al. 2021b) and had to be consistent for all files required:

- Recordings
- Photographs
- Illustrations
- Transcripts
- Contact form

The logic of coding was as follows, just as in the scoping study (Habermann et al. 2021b):

COUNTRY-SITE-TYPE_OF_RESPONDENT-Number-Interviewer (if more than one data collector per site or per social group, e.g. if all men were interviewed by the same person and all women by the other, then it was not necessary to identify the interviewer)

Examples:

- ETH-GB-LI-FHH-1-EG: Ethiopia, Gudo Beret (village), pioneer, female-headed-household number 1, Elisabeth Getahun (=interviewer)
- KEN-MOS-LIf-2: Kenya, Mosop, pioneer female, number 2. Here, all women were interviewed by the same person, so it was not necessary to identify her.
- ETH-AF-HI-GroupDisc-Men2-MS: Ethiopia, Afar, Hidda, Group Discussion, men, group 2, interviewer Mohammed Said.
- KEN-MOS-LIM-3: Kenya, Mosop, pioneer male, number 3. Here, all men were interviewed by the same person, so it was not necessary to identify him.

If the household head could not attend the data-collection appointment, he or she nominated a representative. This person was registered in the coding list/list of socio-economic details with a code associated with the main household head. If it was the spouse, this needed to be mentioned, as well as any other family relation. E.g. the wife of ETH-AF-HI-LIM-1 was ETH-AF-HI-LIF-1, the brother was ETH-AF-HI-LIM-1br.

STEP 2: We had to ensure that the coding list and the list of socio-economic data were coherent, that all information was there, and that the names and codes matched. We noted if there was a family relation between the respondents, e.g. spouses. All the Excel files required coherent naming and formatting. They were processed in STATA.

STEP 3: We saved all the original submitted documents in one folder per site, and we created subfolders for recordings, photos, transcripts, and any other items. This involved:

- cleaning the submitted file for unnecessary information (e.g. moving the socio-economic data to an Excel file and out of the actual data file).
- making sure consistent terms were used, e.g. for local-language names of places, crops, and fodder (when a lot of terms were used, we compiled a glossary).
- making sure that there was a consistent use of codes for the interviewer and respondent (we cross-checked this with the socio-economic data list).
- making sure that the file (and all data) were formatted in the agreed format.
- checking that dates and places were correct and in the files.

STEP 4: We made sure within the team that we all shared the same dataset to avoid data loss or duplicates. The site supervisors also had to get equipment back from the data collectors at this point (e.g. digital recorders, copies/photographs of all paper-related data such as attendance sheets, drawings, or tables done on flipcharts).

Interviews

Each respondent was registered in a coding list with the following parameters:

	Code ETH-DB-TB-LI-5	ETH-DB-GB-LIF-8
Name of community		
Interviewer		
Date		
Name of pioneer		
Telephone number		
Male/female		
Age		
Relationship to HH head		
Marital status		
Name of spouse		
Level of education		
Number of children		
Age of youngest		
Age of oldest		
Primary occupation		
Secondary occupation		
Length of time lived in community		

The transcripts were written coherently as in the example below (YA was the acronym for the person doing the interview, ETH-GB-LIF-6 was the respondent):

YA: Since when you start living here?
ETH-GB-LIF-6: I was born here. Still now I am living in this place.
YA: Okay, tell me more about the farming and what kind of crops you produce.
ETH-GB-LIF-6: As you can see, I have a 1 ha farm. For half of the hectare I use natural fertilizer, which is compost.

The text was ideally proofread before submission, with punctuation used consistently. Terms in the local language were included in the text, but the spelling had to be consistent throughout all transcripts. In addition, a list with all the local-language terms and an explanation for their meaning was attached to the transcripts. This applied equally to acronyms, personal names, names of organisations, and abbreviations.

The text was imported to NVIVO, coded, and analysed. Coding was done based on the research objectives and a team-based coding tree was developed.

Quantitative data from interviews were entered into an Excel form. They were then exported to and analysed in STATA.

Monthly records and samples

Depending on the practice studied, measurements of livestock and samples of feed and/or milk were collected. Thus, the selected animals received individually numbered ear tags. The ear tags were inserted if the farmer consented; if not, then photographs were taken to identify the animals for sampling. Age determination was done by livestock owners and field assistants based on dentition (Torell et al. 1998 in Goopy et al. 2018a). Heart-girth measurements were used to estimate body weight fluctuation for cattle, sheep, and goats (Goopy et al. 2018b). Body condition was determined on a scale of one to five (Edmonson et al. 1989 in Goopy et al. 2018a).

Selecting livestock

Livestock registration for PAA	
HIDDA	Animal ID: HI-LIM1-G1
Livestock owner	Arab Rob
Place	Hida village
Date of registration	15.1.2021
Classification	Adult male castrated
Breed	Afar Goad
Body condition (1-5)	4
Age	2
Sex	m
Colour	White brown

Livestock selection depended on the adaptation practice under study. The number of livestock selected depended on the average livestock numbers in the system. For example, when studying fattening of oxen and sheep in the Ethiopian Highlands, the usual number of livestock was 2 to 3 oxen and 10 to 20 sheep. This number also varied throughout the year, as fattening was practiced seasonally in the Ethiopian Highlands in connection with the annual religious holidays in the country: in-between the holidays there were long periods of fasting for a large part of the Highland population. The sample number for the survey needed to take this into consideration, and the study also needed to take account of the fact that part of the livestock was sold throughout the year. However, this research was not about individual animals over a year's time, but rather about the processes taking place on a livestock keeper's holding over a year and thus all the different seasons of the year. What we wanted to show was how the livestock keepers managed livestock throughout the year, and that included selling and buying (especially if the purpose was fattening) and of course death and disease.

For dairy farming, continuity of observation was important. However, lactation periods in East Africa vary depending on the area and the breed (between 8 and almost 12 months), so it was expected that there would be changes in the number of lactating cows throughout the year. To understand the impact of things like feed and water quality, it was best to observe the treatment of cows before, during, and after the lactation period, as all of this had an influence on her eventual performance. Therefore, the fact that a cow may have stopped lactating throughout the observation period did not have an impact on her inclusion in the observations.

The selection of livestock for this participatory survey had to be done in collaboration with the livestock keeper: he or she needed to be part of the selection process and clearly state his or her own criteria for selection as well. Once an agreement had been reached, a consensus on how to mark the animals was required: this could be done either through ear tagging or by documenting the name and specific characteristics of an animal, including photographic documentation. The latter would apply if the livestock keepers were not comfortable with the ear tagging. Marking and how it was done was documented as scientific evidence, to ensure the scientific soundness of the study.

No of local cattle						
Breed type	Female adults	Male adults	Castrated adult males	Young females (1-2 yrs)	Young males (1-2 yrs)	Calves (< 1 yr)

No of improved cattle						
Breed type	Female adults	Male adults	Castrated adult males	Young females (1-2 yrs)	Young males (1-2 yrs)	Calves (< 1 yr)

No of local sheep						
Breed type	Female adults	Male adults	Castrated adult males	Young females (6-12 months)	Young males (6-12 months)	Lambs (< 6 months)

No of improved sheep						
Breed type	Female adults	Male adults	Castrated adult males	Young females (6-12 months)	Young males (6-12 months)	Lambs (< 6 months)

No of local goats						
Breed type	Female adults	Male adults	Castrated adult males	Young females (6-12 months)	Young males (6-12 months)	Kids (< 6 months)

No of improved goats						
Breed type	Female adults	Male adults	Castrated adult males	Young females (6-12 months)	Young males (6-12 months)	Kids (< 6 months)

No of camels						
Breed type	Female adults >6 years	Male adults >6 years	Castrated adult males	Young females (1-6 yrs)	Young males (1-6 yrs)	Calves (< 1 yr)

Milk sampling

If dairy was the main adaptation practice of the pioneers, then they recorded milk production daily. For this purpose, they were supplied with a graduated plastic container (1500 ml) and a notebook. Researchers copied these notes by taking a photograph during the monthly visit.

Feed sampling

Feed samples were taken if the adaptation practice was either dairy farming or fattening. In dairy farming, this helped us to understand how different feed influences productivity and quality, and in fattening, it indicated efficiency as well as productivity.

Feed samples were taken during the monthly collection from the feed that had been given to the pre-registered livestock. If there was no dominant feed type (e.g., 90% grazing or 80% silage), then all feed types given in that month were sampled. The feed was subjected to standard feed analysis. Ideally, the livestock keeper collected and dried the feed at the time when it was given to the livestock, as it was not always available at the time when researchers came to collect samples monthly. If the livestock keeper gave different feed to different livestock, this was noted in the monthly ODK survey that was done per individual livestock.

We followed an existing protocol for sampling (Marquardt et al. 2020). Feed samples were collected in sequentially numbered sample bags (brown paper bags to be labelled with date, village name, household code, feed characteristics, and ear tag number (or name) of the animal the feed had been given to). If the feed was pasture, then the pioneer had to select the sample based on what he knew his livestock preferred to browse on, as all livestock has selective browsing behaviour.

Weight per sample: Fresh samples contained at least 200 to 300 g. The dried samples were ground in the laboratory to pass through a 1 mm sieve. About 20 – 50 g of dried material were required for standard analysis for the following parameter:

- DM: dry matter
- ASH: total inorganic matter
- N/CP: N=nitrogen, CP= Crude Protein
- NDF: Neutral Detergent Fibre
- ADF: Acid Detergent Fibre
- ADL: Acid Detergent Lignin

Drying samples: The samples were air-dried in a dry and shaded place. This was done on newspapers and the samples needed to be moved every day to prevent mould development, which would spoil them. The dried samples were stored in the above-mentioned paper bags until lab analysis. Alternatively, a domestic oven could have been used for drying the samples at 50°C for a minimum of 96 hours. It is recommended that weight be recorded for fresh, sun-dried, and oven-dried samples (Marquardt et al. 2020).

The sample bag numbers were listed in an Excel file together with the code for the farm, date of collection, and numbers of the animals fed with the feed. The number were used for the analysis request form that went with the samples.

Farm ID	Animal ID	Sample ID	Location	Date/time	Type	Remarks
ETH-DB-TB-LI-5	ETH-DB-TB-LI-5-C-1 ETH-DB-TB-LI-5-C-2	20201102-1	DB-TB …village name	1.11.2020, 9:20	Frushka	(which type…)
ETH-DB-TB-LI-5	ETH-DB-TB-LI-5-C-1 ETH-DB-TB-LI-5-C-2 ETH-DB-TB-LI-5-C-3 ETH-DB-TB-LI-5-C-4	20201102-2	DB-TB …village name	1.11.2020, 9:25	Crop residues of ….	(maize, teff….)

Monthly record sheet

A detailed monthly record sheet was provided through the ODK CollectTM app. This had to be adapted for each site depending on the adaptation practice. The topics covered were:

1. Identifying and measuring livestock: measurement, status, body condition, grazing regime, feeding technology, water source
2. Feed and forage sampling and documentation of feed/ livestock
3. Manure management
4. Farm income from the adaptation practice and whether it was used for nutrition, investment, school fees, or other purposes
5. Farm expenses for the adaptation practice
6. Labour distribution for the adaptation practice
7. Weather observations

An example of the content of ODK forms is available in the appendix (see ODK Form – Example of Debre Birhan [all forms were adapted to the specific site]).

Photographic documentation

To ensure that the photographs documenting the adaptation practices were representative, the photographic documentation had to be planned. A checklist for photographs was used and followed up throughout the research process. The quality of the photographs had to be cross-checked in the field.

Photographs had to be downloaded with a back-up system and named (code and date, e.g. ETH-DB-TB-LI-5_201005 for October 5, 2020 - YYMMDD), so that they could be traced back to the farm where they had been taken. A list had to be maintained for the photographs meant for further usage, that specified the code, the date, and a description of what could be seen in the photograph.

Before taking photographs, permission had to be obtained from the pioneers. Without a signed informed consent form for interviews and consent form for photographs, the photographs could not be used. The pioneer had to specify whether his/her name could be used with the photographs or not.

To plan the photographs accordingly, a photo checklist was helpful. For most of the adaptation practices in this study, the following list applied:

Farmer - men

- Photo portrait: in the shade outside. Looking into the camera. No need to smile.
- Photo portrait: farmer with their family/wife (if they are around)
- Environmental photo: man tending to his livestock (feeding, milking, herding, taking care of health issues, cleaning the barn) - ask them not to look at you
- Environmental photo: working in the field (on fodder crops/trees, with the water dam, rainwater harvesting)

Farmer - women

- Photo portrait: in the shade outside. Looking into the camera. Don't have to smile.
- Photo portrait: with their family
- Environmental photos: kids doing chores at home (cooking, doing homework, etc.)
- Environmental photo: woman tending to her livestock (feeding, milking, herding, taking care of health issues, cleaning the barn) - ask them not to look at you
- Environmental photo: working in the field (on fodder crops/trees)
- Environmental photo: carrying the milk – ask them not to look at you

Other pictures

- Livestock eating grass or fodder
- Livestock roaming in a field or near the home
- Livestock drinking from water dam
- Grass fields (landscape shot)
- Manure piles (landscape shot)
- Milk or tools (closeup shot)
- Shelter: barn, trough for feeding and watering, dairy shade
- Fodder: feed store, feeding/watering trough, farmer showing feed (e.g. in their hand), feed growing in the field, feed processing equipment (grinder, chaff cutter)

Data management strategy

This was handled in the same way as in the scoping study, where a description of this issue can be found (Habermann et al. 2021b).

Appendix

Guidelines for first visit: Scoping interview

Thank you for agreeing to talk to us today. I know you are very busy and appreciate that you are taking time for us. We are [introduce team] from the International Livestock Research Institute. This interview is part of a large study being conducted here and elsewhere in the country, as well as in Kenya and Uganda. The topic of the study is climate-smart livestock. The concept of climate-smart agriculture (CSA) has been widely adopted in the agricultural development community to help increase agricultural productivity and adapt agricultural systems to future climate change while mitigating GHG emissions. The livestock sector, however, remains behind the rest of agriculture in advancing these concepts and mainstreaming climate change into future livestock development strategies. With our research we would like to understand more about adaptation practices and innovations in response to climate change in the livestock sector. Based on this, we hope to inform policies on future responses to climate change in the livestock sector.

Informed Consent (see separate paper)

First, please allow me to ask a few questions that highlight your socioeconomic background [unless these were already collected during the scoping study, in which case just cross-check]:

1) Name of the community: _____

2) Interviewer: _____

3) Date: _____

4) Respondent's name: _____

5) Male ___ Female ___

6) Age: _____

7) Relationship to household head _____

8) Marital status _____

9) *(If in a polygamous household: number of co-wives* _____)

10) Level of education completed _____

11) Number of children: _____

a. Ages of youngest and oldest: _____ - _____

12) Primary occupation _____ _____

13) Secondary occupation _____-_____

14) Length of time lived in the community: _____ years

Revisiting the last interview:

1. The last time we visited you, you told us that …… was the main economic focus of your farm. What has changed about this since then? Please explain the reasons behind it.
2. On this resource map that we made last time, you showed us in which categories you had farmland and forested land. What would you like to correct on this map today? What is the reason behind it?
3. Which parts of the land are your property, and which are rented land? (Ask also if there is land that others have rented from the respondent)
4. These are the numbers you gave us regarding livestock:
   a. ……
   b. ……
   c. ……..

What changes have occurred since then in your livestock composition? Please also explain why these changes occurred.

5. When we last saw you, you indicated that the main sources of fodder for your livestock were…… What has changed, and why?
6. What other changes can you report since our last visit, e.g., regarding manure management, agricultural inputs, or labour management on the farm?
7. What kind of support did you receive in terms of training, credit access, and the like since our last visit? [ask about frequency, how long since the last training, etc.]
8. What other sources have you used recently to get information about livestock and adaptation?

Semi-structured interview guidelines visit I

Thank you for agreeing to talk to us today. I know you are very busy and appreciate that you are taking time for us. We are [introduce team] from the International Livestock Research Institute. This interview is part of a large study being conducted here and elsewhere in the country, as well as in Kenya and Uganda. The topic of the study is climate-smart livestock. The concept of climate-smart agriculture (CSA) has been widely adopted in the agricultural development community to help increase agricultural productivity and adapt agricultural systems to future climate change while mitigating GHG emissions. The livestock sector, however, remains behind the rest of agriculture in advancing these concepts and mainstreaming climate change into future livestock development strategies. With our research we would like to understand more about adaptation practices and innovations in response to climate change in the livestock sector. Based on this, we hope to inform policies on future responses to climate change in the livestock sector.

Briefly revisit informed consent form if not already signed (see separate paper)

Adaptation practice:

We have come here today to talk to you about the ADAPATION PRACTICE (=AP), that you told us about last time we were here. Can you please explain to us what aspects of the AP you appreciate most?

In case it is not clear from the first visit in the scoping study, the following issues need to be clarified, and others need to be further explored (read the transcript of the first visit thoroughly to avoid duplication):

- Detailed technical description of AP (what they are doing, why in this way, how it improves productivity, and so on – if possible, ask to participate in the implementation!)
- Since when has this AP been in practice?
- Why did you start it and what was the trigger?
- How did you learn about it?
- What have you learned from implementing it so far?
- What have you improved/changed as compared to the original technology?
- Whom do you know who has adopted this technology from your example?
- How has it contributed to your livelihood?
- In what way does it help you to adapt to climate change?

Learning:

- What sources of information are you using to obtain more information about
    - Livestock management in general
    - The AP in particular
- How did you learn about these? Who told you/invited you?
- Who is the person in your village that gets this kind of information first?
- When did you last consult or get advice on livestock management from….
    - Extension – which?
    - NGOs – which?

- Government – specify
- Friends
- Neighbours
- Family
- Media – specify
- Other - specify

Which are the most/least important sources of information for the AP?

	Most	Least
Extension government		
Extension private		
Government other (specify)		
NGOs (specify)		
Friends		
Family		
Neighbours		
Media (specify)		
Other (specify)		

Impact on household:

Who in the household is involved in the AP? Please describe their specific roles and labour assignments.

- How much of your time do you invest in the AP daily? What about other household members?
- Who in the household benefits from the AP?
- Who experiences a negative impact?

Regarding the **labour burden** resulting from the ADAPTATION PRACTICE, who has the most and who has the least of the burden?

	Most	Least
Male/female head of HH		
Female HH members		
Youth HH members (< 16 years)		

Since you started the ADAPTATION PRACTICE, how has the **labour burden** changed for different HH members? (1 = increased, 2 = unchanged, 3 = decreased)

	1	2	3
Male/female head of HH			
Female HH members			
Youth HH members (< 16 years)			

Impact on livelihood:

- What was your initial investment in the AP?
- How did you manage the investment?

- When did it become profitable?
- If applicable, ask about marketing:
  - Ask about the livestock-related products in question (e.g., milk, meat, hides, fodder, seeds for fodder, hay).
  - Ask about the current amount sold, prices obtained, and marketing system (e.g., through middlemen or cooperatives, or self-marketing).
- If applicable, ask about resource requirements for the AP:
  - Which products did you have to buy to implement the AP?
  - Which products do you have to buy on a regular basis for the AP?
- Use of the profits: Phrase this question carefully with respect to the cultural context: probe as to whether profits were re-invested in the AP, in other innovations, in school fees, house renovations or buildings, buying land, or other purchases.
- What changes were you able to pay for on your farm?
- What changes were you able to facilitate for other purposes?
- Who in your household has benefitted from those changes?

Regarding the **benefits** resulting from the ADAPTATION PRACTICE, how would you assess the extent of the benefits on a scale from 1 to 5 (1 = very little, 5 = most benefits).

	1	2	3	4	5
Male/female head of HH					
Female HH members					
Youth HH members (< 16 years)					

Impacts on social life:

- How would you describe your role in the social life of your village?
- Who is coming to you to seek advice about livestock management? (1 = rarely, 2 = sometimes, 3 = frequently)

	1	2	3
Family			
Friends			
Neighbours			
Others			

- How did other people react when you started the AP?
- If you think about social interactions with neighbours, family, friends, how has this changed since you started the AP? (1 = increased, 2 = unchanged, 3 = decreased)

	1	2	3
Family			
Friends			
Neighbours			
Others			

Thank him/her for the interview, the time, and the information provided. Explain what the project will do next and how he/she can get in touch with us.

ODK form – Example of Debre Birhan [all forms were adapted to the specific site]

MONTHLY RECORD KEEPING				
AP:	FATTENING			
Site:	DEBRE BIRHAN			
Starting:	Nov-20			
Data collector:	Shenkute Goshme			
Name of LI				
Place				
Date				
Adaptation Practice				
Step 1: Identifying and measuring livestock **Enter the following parameter for the livestock numbered with eartags**				
	eartagnumber	eartagnumber	eartagnumber	eartagnumber
Heart girth measurement (cattle) cm				
Weight (sheep) kg				
Status (deceased=1, sold=2, sick=3, new acquisition=4, new born =5)				
Body condition (1-5)				
Livestock kept zero-grazing (1) meaning no time outside, semi-zero-grazing (2) meaning up to 50% outside, full grazing (3) meaning 100 % outside				
Fed from feeding trough (y=1, no=2)				
Separated from other ruminants (1), kept together with other ruminants (2), only partly together/separated (3)				
Water source (river=1, public tap =2, own well=3, rainwater pond=4, water tank=5, water carried to the house= 6, other=7)				
Remarks				

Step 2: Feed and forage ***(sample to be collected from major feeds of this month)***				
In the last 30 days, the main source of feed for fattening cattle were (allocate scores from 1 to 10 in shape of bags/bundles):			**days, the main source of feed for fattening sheep were (allocate scores from 1 to 10 in shape of**	
Grazing	own land		**Grazing**	own land
	rented land			rented land
	public land			public land
	Other:			Other:
Crop residues	Wheat		**Crop residues**	Wheat
	Barley			Barley
	Beans			Beans
	Oats			Oats
	Other:			Other:
Grass	fresh		**Grass**	fresh
	dry			dry
Alfalfa	fresh		**Aflalfa**	fresh
	dry			dry
Phalaris	fresh		**Phalaris**	fresh
	dry			dry
Oat and vetch	fresh		**Oat and vetch**	fresh
	dry			dry
Tree lucerne	fresh		**Tree lucerne**	fresh
	dry			dry
Home made feed supplements	Fine		**feed supplements**	Fine
	Sama			Same
	Gird			Gird
	Atela			Atela
	Atmit			Atmit
	Illet (Tefitre, Shirkit…)			Illet (Tefitre, Shirkit…)
Feed supplements from factories	Beer factory byproducts		**Feed supplements from factories**	Beer factory byproducts
	Molasses			Molasses
	Teftire/Shirkit			Teftire/Shirkit
	Other:			Other:
Feed supplements from markets	Frushka		**Feed supplements from markets**	Frushka
	Fagulo			Fagulo
	Mineral salt			Mineral salt
	Medaberia (Fertiliser)			Medaberia (Fertiliser)
	Other:			Other:

Step 3: Manure management in the last 30 days	
If the animals were kept separately, was their manure mixed or was it used separately?	
If the animals were not confined, what did you do with their manure?	
How many hours a day did the livestock stay in the confinement (zero/semi-zero grazing)?	
How many hours in a day were the livestock out of the confinement? (i.e. grazing, ranging, scavenging around farm and yard)	
How often was the confinement cleaned?	
Who in your household cleaned the confinement?	
How far was the nearest water source from the confinement location?	
How did you clean the barn (1=water & washing, 2= removing bedding materials mixed with animal excretions, 3=removing animal excretions & urin, 4=removing animal excretions and urin separately)?	
If urin/manure/slurry was collected in the last 30 days, where and how was it stored?	
How much of the following was used for selling (1), burning as fuel (2), fertilising crops (3), storing for compost and later use as fertiliser for crops (3), discarded and left somewhere away from the farmland/pastures (4), burned as waste (5), biodigester (6)?	urin/manure/slurry
If 3, on which crops was it used?	
How much manure did you buy in the last 30 days?	

Step 4: Farm income from fattening in the last 30 days			Income/produce used for:			
Which animal products have contributed income/nutrition for the family?	Income in ETB	Type of livestock	Improved nutritition	Investment in farm	School fees	Other
Meat for home consumption	ETB	cattle/sheep	y/n	y/n	y/n	openfield
Hides sold	ETB	cattle/sheep	y/n	y/n	y/n	openfield
Full animal sold	ETB	cattle/sheep	y/n	y/n	y/n	openfield
		le/sheep	y/n	y/n	y/n	openfield

Step 5: Farm expenses for fattening in the last 30 days			
How much money did you spend for fattening in the last 30 days for the different animals in this study?			
Veterinarian	ETB	eartagnumber of animal	
Medicine	ETB	eartagnumber of animal	
Feed supplements from factories	Beer factory byproducts	ETB	sheep/cattle
	Molasses	ETB	sheep/cattle
	Teftire/Shirkit	ETB	sheep/cattle
	Other:	ETB	sheep/cattle
Feed supplements from markets	Frushka	ETB	sheep/cattle
	Fagulo	ETB	sheep/cattle
	Mineral salt	ETB	sheep/cattle
	Medaberia (Fertiliser)	ETB	sheep/cattle
	Other:	ETB	sheep/cattle
Investments for fattening:			
New feeding trough	ETB	cattle/sheep	
Improvement of existing feeding trough	ETB	cattle/sheep	
Feed store	ETB	cattle/sheep	
New barn	ETB	cattle/sheep	
Improvement of existing barn	ETB	cattle/sheep	
General repair work on fences, trough, barn, feed store…	ETB	cattle/sheep	
New livestock for fattening	Sheep	number/classification	ETB
	Cattle	number/classification	ETB

Step 6: Labor distribution for fattening in the last 30 days

Who has mainly been taking care of these chores in the last 30 days?

CATTLE	Male Children up to 14 years	Female Children up to 14 years	Women	Men	Laborers
Herding					
Cleaning the barn					
Collecting feed from field					
Preparing feed at home					
Buying feed elsewhere					
Feeding livestock					
Collecting water from elsewhere					
Watering animals at home					
Watering animals outside home					
Slaughtering and dissecting at home					
Selling hides					
Selling live animals					
Other:					
SHEEP	**Male Children up to 14 years**	**Female Children up to 14 years**	**Women**	**Men**	**Laborers**
Herding					
Cleaning the barn					
Collecting feed from field					
Preparing feed at home					
Buying feed elsewhere					
Feeding livestock					
Collecting water from elsewhere					
Watering animals at home					
Watering animals outside home					
Slaughtering and dissecting at home					
Selling hides					
Selling live animals					
Other:					

Step 7: Weather observations

OBSERVATION: n/a in this month=0, normal =1, more frequent/intense than usual =2, abnormal = 3, extreme deviation from normal = 4)

IMPACT ON LST: direct cause of diseases or death=1, decrease in productivity =2, fodder crops destroyed =3, lack of water =4, other….)

	Observation	Impact on livestock
Wurch		
Ameday		
Berado		
Wind		
Rainfall		
Intensity of radiation (sun)		
Heat		
Other		

Contact summary form

Contact type: Scoping visit / 1st interview / 2nd interview / 3rd interview Monthly record-keeping visit month _____			**Site: _____** **Date:_____**
Code:		Phone:	

1) **What were the main issues or themes that struck me in this contact? (personal perceptions of observed dialogues, remarks and emphasis on various issues during the encounter, what were he/she/they most/least comfortable talking about)**	
2) **Note here which topics you could not cover and why**	
Not covered	**Why?**
3) **Which possible effects of climate change in the area have you observed?**	
4) **What other important social, economic or environmental drivers were you able to observe?**	

5) **Take notes on innovative farming practices and adaptation practices linked to climate change:**

a. observe how local land users are implementing these practices,

b. who is involved,

c. which resources are required,

d. whether there are other local land users doing the same,

e. whether they learn from each other,

f. whether it is successful and what the outcomes are,

g. and which challenges you notice that were not mentioned during the interviews.

6) **Any other observations**

Template for Transcripts

Header:

PCSL Interview transcript: [Place: Debre Birhan], [Interviewer: EG], [Date of interview 2019/10/15], [Respondent ETH-DB-KI-1]

Body:

Name of interviewer: Birgit Habermann, interview transcribed by Tigist Worku
Code for respondent: ETH-DB-KI-1
Place, date, duration and time of interview: Debre Birhan, 15.10.2019, 35 min, 10:15 am.
Program used for transcription: Express Scribe
Original language of interview: English
Type of interview (Key informant interview, Pioneer interview, Group discussion): Key informant interview

EG: Since when you start living here?

ETH-DB-KI-1: I was born here. Still now I am living in this place.

EG: Okay, tell me more about the farming and what kind crops you produce.

ETH-DB-KI-1: As you can see, I have a 1 ha farm. For half of the hectare I use natural fertilizer, which is compost.

Guidelines for Documentation of Field Days

Participant observation at field day: contact forms (see enclosed)

- Note-taking by observers in contact forms and notebooks
- Capturing the discussion, points of agreement, points of divergence
- Participant reactions
- How the host presents
- What kind of questions follow
- What can be seen and what is (and is not) demonstrated

At the end of the field day, hold brief focus group discussions with participants (2 groups).

Introduction: Thank you for participating in today's learning event. This was the first time we met in this group, but we hope to be able to stay in touch with you for the next 8 months. We also hope that we can have a second meeting like today. Now I want to ask you a few questions in this group about how you experienced this day and what you are taking home from here.

1. How did you experience this day? What feedback would you like to give to your host?
2. Whom did you communicate with most on this day? What prevented/supported dialogue?
3. What are the main things you learned today? How useful are they for you? What was new?
4. If you said this practice is useful and interesting, if you were to do it, what would you have to do? How would you adapt it, and which challenges and opportunities do you see for yourself?
5. What other comments do you have? What do you want us to do for the second learning event?

Wrap up: Thank you for your feedback, this helps us a lot. Let me please remind you, that we would like to stay in touch with you and contact you for a short follow-up interview to see how useful this field day was for you, and to understand what we can do differently next time. We hope to see you again at the second field day in about 8 months' time.

Follow-up interview with host

1. What did you take away from the learning event (field day)?
2. What have you learned by presenting this to other people? How do you think the participants experienced this day?
3. Who were the people who asked most of the questions and who interacted most with you? Why them?
4. What prevented dialogue and what could have supported dialogue more?
5. Do you feel you are an authority on a topic in your community? What would that be?
6. How transformative/impactful was this for you in terms of your active sharing with other people?
7. What do you think the participants got out of it? What feedback did you get? What new things did you learn in talking to the others?
8. How has the learning event (field day) changed your perception of yourself and the perception of others about you?

Photographic documentation: for example, Debre Birhan, sheep fattening

- Document demonstration of feed preparation
- Photo of farmer feeding the sheep
- Photos of the sheep
- Photos of the places where they 1) grow forage crops, 2) process forage crops, 3) store forage crops, 4) keep the sheep (pasture, barn, feeding trough)
- Photos of the family (e.g. children who are benefitting from the improved income through improved nutrition)
- Photo of farmer discussing the feed and the sheep with other farmers
- Photos of the place where they buy feed and where they sell the sheep

Contact Summary Form — Field Days

Contact type: Field day 1 Field day 2			**Site: _____** **Date:_____**
Code of farm:		Phone:	
1) **WHAT WERE THE MAIN ISSUES OR THEMES THAT STRUCK ME DURING THE DAY? (personal perceptions of observed dialogues, remarks and emphasis on various issues during the encounter)**			
2) **WHAT DID YOU OBSERVE REGARDING THE FARMER/PASTORALIST AND HIS INTERACTION WITH OTHERS?**			
3) **WHAT DO YOU THINK HE/SHE DID NOT SHOW AND WHY?**			
4) **WHICH TOPICS DID YOU FEEL HE/SHE WAS MORE/LESS COMFORTABLE WITH?**			
5) **TAKE NOTES ON INNOVATIVE PRACTICES AND ADAPTATION PRACTICES LINKED TO CLIMATE CHANGE:** a. observe how local land users are implementing these practices, b. who is involved, c. which resources are required, d. whether there are other local land users doing the same, e. whether they learn from each other, f. whether it is successful and what the outcomes are, g. and challenges that you notice were not mentioned.			

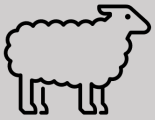
6) **WHAT WERE THE MAIN OBSERVATIONS, COMMENTS, AND QUESTIONS BY THE VISITING FARMERS/ PASTORALISTS?**
7) **HOW WOULD YOU DESCRIBE THE GENERAL MOOD AMONG THE VISITING FARMERS/ PASTORALISTS?**
8) **WHAT FOLLOW-UP AGREEMENTS WERE MADE BETWEEN THE FARMERS/PASTORALISTS?**
9) **WHICH ACTION OR WHAT SUPPORT WILL BE NECESSARY TO ENABLE THIS FOLLOW-UP?**
10) **ANY OTHER OBSERVATIONS**

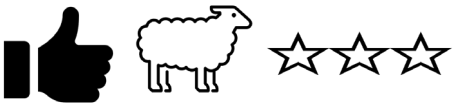
List of Deliverables

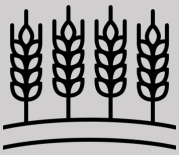
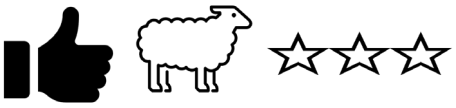
DELIVERABLES PAA	Content	Due by	Debre Birhan (Eth)
Recordings			
	Scoping interview	02 2021	
	SSI1	02 2021	
	SSI2	different times	
	SSI3	different times	
Updated maps	Maps as pdf or jpg	02 2021	
Forms			
	Selecting Pioneers final names	02 2021	
	dataentry.xls (SE details up-date)	02 2021	
	photolist.xls	ongoing	
	Sample request form	ongoing	
	Ear tag /animal ID registration	03 2021	
	Milk record sheets	ongoing	
	Breeding record sheets	ongoing	
	Informed consent	02 2021	
	Photographic consent	second half	
Transcripts			
	Scoping interview	03 2021	
	SSI1	03 2021	
	SSI2		
	SSI3		
Contact forms			
	Scoping interview	03 2021	
	SSI1	03 2021	
	SSI2		
	SSI3		
	Monthly visit 1	different times	
	Monthly visit 2	different times	
	Monthly visit 3	different times	
	Monthly visit 4	different times	
	Monthly visit 5	different times	
	Monthly visit 6	different times	
	Monthly visit 7	different times	
	Monthly visit 8	different times	
	Monthly visit 9	different times	
	Monthly visit 10	different times	

	Monthly visit 11	different times	
	Monthly visit 12	different times	
	Field day series 1	different times	
	Field day series 2	different times	
ODK survey [for now please continue to make back-ups]	Monthly visit 1	different times	
	Monthly visit 2	different times	
	Monthly visit 3	different times	
	Monthly visit 4	different times	
	Monthly visit 5	different times	
	Monthly visit 6	different times	
	Monthly visit 7	different times	
	Monthly visit 8	different times	
	Monthly visit 9	different times	
	Monthly visit 10	different times	
	Monthly visit 11	different times	
	Monthly visit 12	different times	

Pioneer Training Evaluation Sheets: Example of Debre Birhan

Time of day	 **Day 1 Animal production**	**Any other remarks or suggestions for improvement**
 **morning**	  How well did you understand the explanations?	
	   How useful was this part of the training for you?	
	  How interested are you in teaching others about this? 	

 **afternoon**	 How well did you understand the explanations? 	
	 How useful was this part of the training for you?	
	 How interested are you in teaching others about this?	

Time of day	**Day 2 Animal feed** 	**Any other remarks or suggestions for improvement**
 **morning**	 How well did you understand the explanations?	
	 How useful was this part of the training for you?	
	 How interested are you in teaching others about this? 	

afternoon	☆☆☆ How well did you understand the explanations?	
	How useful was this part of the training for you?	
	How interested are you in teaching others about this?	

Time of day	**Day 3 animal health**	**Any other remarks or suggestions for improvement**
morning	☆☆☆ How well did you understand the explanations?	
	How useful was this part of the training for you?	
	How interested are you in teaching others about this? ☆☆☆	

Informed Consent

Research topic: Participatory Adaptation Analysis. Learning from adaptation pioneers.

I am …… from the International Livestock Research Institute (ILRI). ILRI works with partners worldwide to enhance the roles that livestock play in food security and poverty alleviation in Africa and Asia. ILRI is implementing the Program for Climate-Smart Livestock Systems (PCSL). PCSL aims to enable key livestock stakeholders to increasingly direct their livestock practices, sector strategies, and policies towards the achievement of climate-smart livestock systems. The program is funded by the German Corporation for International Cooperation (GIZ). GIZ is a German development agency that works towards alleviating famine in developing countries.

Purpose of the study

PSCL supports interventions to increase the contribution of livestock production to the three key pillars of climate smart agriculture (CSA)

Benefits to the respondent/discussant

Research findings will be shared with farmers through farmer trainings, farmers meetings, or workshops. Field days will be carried out to highlight among other things, farmers' positive contribution to successful adaptation and mitigation of the effects of climate change.

Please note that this is a research project without any development or intervention component. We cannot offer you any long-term benefits based on today's discussion. However, we will share our findings on this research with you. Research findings will also be used to lobby for more focus on adaptation in livestock farming for better interventions to support local land users in their efforts to adapt to climate change. Please note that this project has a 4-years duration, so do not expect immediate results.

About the interview

- You have been selected for this interview based on criteria decided at the beginning of the study. Due to time constraints, we cannot talk to everyone, but we have to agree on a selected sample.
- This discussion should take approximately 1 hour. Your name will not be used in any reporting and the information, if used, will be kept anonymous.
- You are free to decide if you do not want to participate at any time. If you agree to participate, please tell us when a question is unclear to you.
- We would like to record this conversation so that we can ensure that we capture all the details, because some may be lost during notetaking.
- We will be asking you questions about your agricultural practices. Should you feel that any of the knowledge shared with us requires legal protection in terms of intellectual property rights, please do inform us so that we can avoid processing this information in any public documents. (This requires appropriate explanation for relevant aspects for each community!)

Privacy and confidentiality

The audio files, videos, and notes will be considered confidential, and no one except the research team will have access to them. Once ILRI has completed analyses of these materials, ILRI will discard them through means that guarantee confidentiality. The reports generated from these data will also uphold discussants' confidentiality. The findings of this study will be shared appropriately by ILRI without specifying the names of the participants, through feedback sessions. Films, photographs, audio

recordings, or images of me (discussant/respondent) may be published on ILRI and on partner websites and remain there for an indefinite number of years.

Voluntary participation

Participating in the survey is voluntary and choosing to withdraw will not affect you or your relationship with ILRI now or in the future. ILRI will not tell anyone about your objection to participation. You are also free to not answer any question that makes you uncomfortable. Giving your consent (discussant/respondent) to the publication of these materials (films, photographs, audio recordings, or images of me) will not lead to your receiving any monies or gifts now or in the future unless specified by ILRI.

Approval of the research in Uganda/Kenya/Ethiopia

E.g. 'The research has been approved by the Research and Ethics Committee (REC) of the Vector Control Division under the Ministry of Health in Uganda.'

Provision of a witness

For participants that are either illiterate, mentally incapacitated, or physically handicapped, a witness may be provided.

Please indicate the type of informed consent

☐ **Photograph** ☐ **Videotape** ☐ **Audiotape** ☐ **data collected and entered on tablets/sheets**

Discussant's declaration: 'I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I had have been answered to my satisfaction. I voluntarily consent to participate in this study and understand that I have the right to withdraw from the discussion at any time with no consequences.'

Researcher's name_____ Signature_____ Date _____

Discussant/ Respondent's name _____ Signature/Thumbprint_____
Date_____

Witness' Name_____Signature/Thumbprint_____ Date_____

ILRI consent form: Photography use for human subjects

The International Livestock Research Institute (ILRI) works with partners worldwide to enhance the roles that livestock play in food security and poverty alleviation, principally in Africa and Asia; and it is a CGIAR Research Centre. Because this is part of the PCSL research project, we will be taking photographs of you during your participation in the project. Please indicate what uses of this photograph you are willing to consent to by initialling below. You are free to initial any number of spaces from none to all of them, and your response will in no way affect your credit for participating. We will only use the photograph in ways that you agree to. In any use of this photograph, your name will not be identified unless you explicitly give us permission to do so. If you do not initial any of the spaces below, the photograph will be destroyed.

Please indicate the type of informed consent: Photograph

I give my written consent to ILRI or individuals acting on ILRI's behalf to take, publish, and disseminate photographs of me on the understanding that:

- this information will be used in communications, media, advertising, publications, educational material and/or public awareness activities (including newspapers, magazines, books, television, the internet, leaflets, and letters) to promote issues pertinent to the ILRI mission.
- Photographs or images of me may be published on ILRI and partner websites and remain there for an indefinite number of years.
- other organisations, such as the media, may have access and use photographs or images via links on ILRI and partner websites (in accordance with Creative Commons licence 3.0).
- I will inform ILRI prior to their taking my photograph of any politically or culturally sensitive, taboo, or high-stigma issues that may arise as a result of these activities.
- information identifying me or my location will not be published (distributed to third parties) by ILRI without my prior consent.
- giving my consent to the publication of these materials will not lead to me receiving any monies or gifts now or in the future.
- I can ask ILRI to remove all or part of the photograph at any time by contacting them on (address see below) and ILRI will comply as soon as reasonably possible.

First name: Surname:

Email: Telephone:

Do you agree to allow ILRI to use your first name? YES ☐ NO ☐

I have read the above description and give my consent for the use of the photograph as indicated above.

Signature/initial: Date: _____

F2F demonstration and learning days in PCSL: Follow-up questions

…. months ago, you participated at a field day held on the farm of……. At that time we told you that we might contact you again with some follow-up questions.

If you have time now, please let me ask you the following:

1. The field day was planned as a learning event, with focus on knowledge exchange among livestock keepers. In hindsight, what do you remember most about the field day?
2. We asked you this on the same day, but now, a few months later:
    a. What did you learn from the workshop?
    b. What would you say was new and/or different about what you learned there?
    c. If given another learning opportunity, what would you want to learn regarding the adaptation practice?
3. What have you implemented from what you learned at the field day?
    a. What is your experience so far with implementing what you have learned? Any challenges?
    b. What support were you able to get from the field day host, other field day participants, neighbours, or extension officers?
    c. What kind of improvement did you incorporate in your adaptation practice after the field day, and how would you describe its importance to your practice?
4. We were hoping to encourage you to share your own knowledge and possible new things you have learned on the field day with other livestock keepers.
    a. Approximately how many other livestock keepers would you say you have been sharing your knowledge with since the field day?
    b. What opportunities have you had to train others since then, if any?
    c. What response did you get from others?
5. What ideas and suggestions do you have to make such learning opportunities more impactful?
6. Any further comments or questions:

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ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

The International Livestock Research Institute (ILRI) works to improve food and nutritional security and reduce poverty in developing countries through research for efficient, safe and sustainable use of livestock. Co-hosted by Kenya and Ethiopia, it has regional or country offices and projects in East, South and Southeast Asia as well as Central, East, Southern and West Africa. ilri.org

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