Research protocol: Adaptation practices in livestock systems—scoping study

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Rationale

This research protocol explains how to identify and document local climate change adaptation practices in diverse environments. While various practices are of interest, we are particularly interested in identifying innovators and their innovations to build adaptation on existing change dynamics. There is a plethora of literature on adaptation and climate change, but very little research that points out which drivers and social processes lead to successful implementation of adaptation practices. The environments we are looking at are not only diverse, but also extremely complex in their agro-ecological, environmental, socio-economic, and political contexts.

At times when climate change has exacerbated the extent of climate-related dynamics (Thornton et al. 2009), and hence added new challenges, it is ever more salient to understand why some local land users are succeeding unexpectedly under conditions where everyone else is struggling to cope. Climate-smart agriculture (CSA) seeks to offer solutions for local land users to economically benefit from applying agricultural practices that reduce their negative impact on climate change such as high levels of GHG emissions. But to make CSA successful, research needs to look beyond the indicators and technologies related to climate change; moreover we need to understand 'the links between farming and livelihood practices, other possible adaptation options, and the effects on farm performance, which is conceptualised by farmers as wider than yields.' (Hammond et al. 2017: 1).

Focusing on site specific practices and technologies relevant to local farmers is crucial to understanding local farmers' agro-ecological and socio-economic needs and priorities (Khatri-Chhetri et al. 2017; Crane et al. 2011). It is also important to provide more information about available CSA technologies relevant for specific locations, while not neglecting the importance of providing access to financial resources to enable land users to adopt relevant technologies (Khatri-Chhetri et al. 2017). However, even in situations where information and financial resources are available, the successful implementation of new or existing technologies is difficult to upscale to larger groups of land users or even beyond specific communities. In addition, we need to try to understand how responses to climate stresses interact with other drivers, whether synergistically or antagonistically. This includes factors that constrain the ability to adapt. Overall, we know very little about the multiple drivers that make land users successful in situations of stress, and why some unexpectedly succeed in implementation of certain technologies as adaption practices, and others don't. To gain a better understanding of these drivers, and to understand what is needed to enable farmers and pastoralists to successfully manage adaptation to climate change, we used the concept of positive deviance (Albanna and Heeks 2019; Steinke et al. 2019; Zeitlin 1991). Positive deviants are those members of a population that perform better than others while having access to the same resources, facing similar or worse challenges, and differing from others mainly in their motivation, behaviour, and/or strategies (Adelhart Toorop et al. 2020).

Research questions

1. What adaptation practices are already being implemented in livestock systems?
2. What innovations are emerging in response to climate-driven stressors?
3. What conditions or characteristics characterise local innovators?
4. What indicators are relevant to assess adaptation practices of positive deviants with PAR?

Overview on methods

The methods described in detail in this research protocol are:

1. Key informant interviews / semi-structured interviews.
2. Group interviews
3. Timelines
4. Mapping
5. Ranking
6. Transect walks
7. Observation

Preparation

Literature review

The research started with a review of the literature. For this we made use of online search databases (for example CAB Direct, SCOPUS, JSTOR, and Web of Knowledge). We selected relevant literature based on the key words 'adaptation', 'livestock', and 'country' in the last five years. Then we scanned abstracts based on the following questions:

- Which resources were needed to implement the adaptation practices, and where did the resources come from?
- How has the practice merged? Was it an outside organization, or did it come from the inside, a government initiative, or an endogenous development?
- To what extent is the practice described traditional, endogenous, modern, imported, or a blend?
- Who were the main actors driving the innovation (adaptation practice)?
- What made them successful (as individuals or groups)?
- Which methods were used (by the researchers) to assess the adaptation practice for its successes and failures?
- What can we learn from this example for our participatory field?

Output: Documentation of each paper reviewed in the literature review catalogue (I Literature Review Catalogue) for future reference.

Site selection

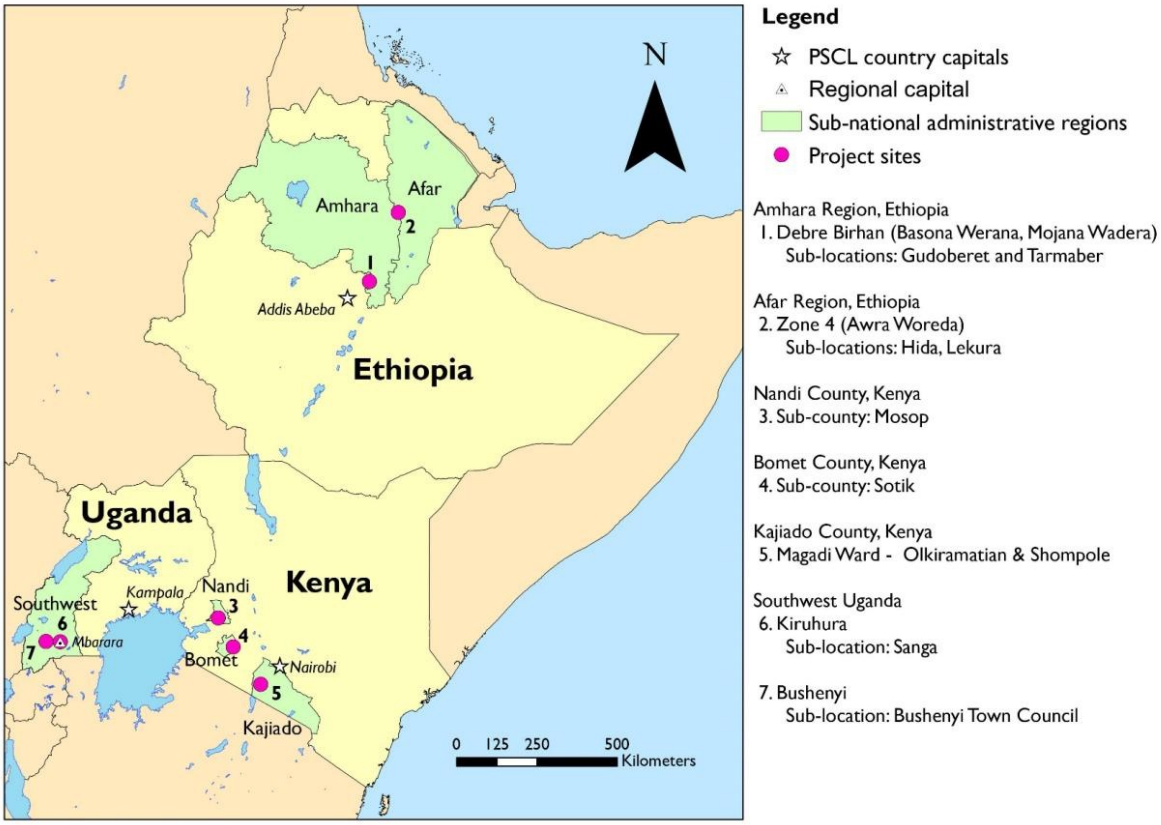
We selected sites that were linked to ongoing project activities, if possible. This helped us to better understand the response of local land users to interventions and technologies introduced from outside organizations, in addition to government interventions and the endogenous development of technologies.

We identified five study regions for the PCSL:

- Debre Birhan Zone, Amhara Region, Ethiopia: this area was selected because it is a mixed-crop livestock system with an on-going Africa RISING site. Choosing one district/kebele (Woreda) inside the study area of Africa RISING and one outside their study area gave us the opportunity to see how much impact a project like this could have in terms of innovations in adaptation (Gudo Beret, Tarmaber).
- Awra Zone, Afar Region, Ethiopia: this area was selected because it is a pastoral area in the vicinity of the Ethiopian Highlands. It is in a hot and dry climate. There, the ongoing interventions of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) presented the opportunity for partnership and of studying the development of innovations in adaptation. Our research was done in two neighbouring kebeles (Lekura and Hida).

- Bushenyi and Kiruhura districts, Southwestern Region, Uganda: these sites were selected because they included both a mixed-crop livestock system (Bushenyi) and a more pasture-based livestock system (Kiruhura), with some dairy farmers cultivating staple crops.
- Olkiramatian and Shompole Group Ranches, Kajiado, Rift Valley Province, Kenya: like the Afar Region, this area is a pastoral area in a hot and dry climate.
- Nandi and Bomet Counties, Central Province, Kenya: these are mixed-crop livestock systems. Both counties have been studied by ILRI in the Greening Livestock Project. Sotik and Mosop sub-counties were selected for in-depth research.

Figure 1. Map indicating the locations of the different sites.



Source: Michael Graham/ILRI.

Criteria for site selection were:

- Either a mixed crop-livestock or agropastoral system.
- Upland/lowland interaction.
- Rangeland management and forage improvement.
- Adaptation practices already in place, either existing, 'old' practices or introduced ones.
- Feasibility.

The purposive sampling strategy within the regions varied depending on the conditions in place. At each site a local launch workshop was held with key informants at the district or county level and the next subunit. Based on this information, the sites were selected. This was to avoid, for example, selecting a subunit where farmers were focusing on tea, but not on livestock. Note that the administrative sub-units were different in each country, not only in name but in size. Nandi County in Kenya is the size of a region, and even the sub-counties are big. Kebeles in Ethiopia, on the other hand, could be smaller in area coverage than they seemed because of the extremely high population density in the Ethiopian Highlands. The following steps needed to be taken:

1. Collecting information on the area, population size, topography and agro-ecological zone of the sample unit, as well as the presence of other organizations like NGOs and projects implemented in the area.
2. Consulting local counterparts as key informants about the sub-unit to be selected. Ideally schedule a field visit to select the sub-unit for sampling. Criteria in addition to the above were area, population density, expected cooperation of counterparts (e.g. government and GIZ) and livestock keepers, modality of interaction (expectations on per diem payments and other incentives), and ongoing projects.
3. Ensuring that each sample unit had two sub-units, e.g. in SW Uganda it was two neighbouring parishes, and the same in Ethiopia (with one kebele each), in Western Kenya two neighbouring counties with one sub-county each. In Kajiado, it was one sub-county with two community group ranches.

Use of secondary sources

Secondary sources were useful to help us understand what information was already there, avoid duplication in data collection, identify the main development partners in the area, and collect statistical background data on population, land use and ownership, political and historical development, project histories, effects of climate change, and existing adaptation practices. We used the following sources:

- Project reports of the study sites
- District-level reports
- Statistics available from official resources

Output: A site overview in a table with base data for all project sites (including resource persons) for reference (II Field Site Parameter Overview).

Training of data collectors

Data collectors had to undergo at least a two-day training, or more, depending on their background and previous experience. It was crucial that they understood the nature of this research, and that they had the necessary skills to undertake this research (a certain degree of curiosity and social skills), as well as the ability to probe and follow up on emerging topics during the open-ended interviews.

Data collectors had to familiarise themselves with the research protocol, not only regarding data collection but also data storage and management. Listening carefully and asking the right question is essential, as well as probing when possible (Johnson et al. 2010).

The terms of references for data collectors included a list of deliverables and the following:

Research assistants are needed to support data collection and documentation of the data.

- Highest Education Level: Bachelor's
- Years of Work Experience: 5 years
- Relevant Training Skills Acquired:
    - Qualitative social research skills
    - Experience with semi-structured interviews, group interviews

    - Translating and transcribing qualitative social research data
    - Working in Excel and Word
    - Preparing qualitative social research data for analysis
- Previous experience working with research and/or academic organizations.
- Language preferences: A woman and a man who speak both … [local language] and English fluently are required.

Data collection stage I: Introduction and identification of innovators

This stage of the scoping study served for further familiarisation with the project area, and to establish contacts with leadership in the area, as well as collection of more information about existing adaptation practices and their performance.

We used the term 'local innovator' preliminarily to explain to field assistants and facilitators what we were looking for. Furthermore, we were seeking local definitions for the phenomenon of 'positive deviance', possibly using local terms, and local definitions for the criteria leading to the selection of positive deviants. Positive deviance refers to those individuals who exhibit better performance than others under the same circumstances. (Birhanu et al. 2017; Lapping et al. 2016; Spreitzer and Sonenshein 2016; Steinke et al. 2019)

Interviewing key informants

In terms of key informants, we interviewed livestock experts at the district and municipal level, depending on the circumstances at the regional/county/zonal level and if applicable, livestock and adaptation experts linked to projects operating in the study site area, as well as local leaders or clan leaders at the study sites.

Method: Key informant interviews according to prepared semi-structured interview guidelines.

Documentation: Ensure that the researchers who translate/transcribe are clear about the reporting requirements. We sent them the template form for data entry beforehand and explained it to them.

- Coding list for key informants
- Recordings: provide recordings plus translations/transcriptions, both with file names according to the coding list.
- Table to register socio-economic details
- Table to enter data from adaptation ranking

Output: Statistics on livestock and adaptation practices (if not available from on-site project), information on interventions/trainings offered, projects operational in the area, more information on climate stress in the area and responses, and major drivers of change in the livestock system.

Deliverables: List of ranked adaptation practices, list of codes for interviews, list of socio-economic details for respondents, recordings and translated transcriptions of the interviews

Materials required:

- Interview guidelines, informed consent form, project flyer, recorder, notebooks, pens
- Approval letter from administrative body, copies of research permits to provide to officials

Group interviews

The purpose of the group interviews was to follow up on issues of climate stress in the area and the responses to these of local land users, as well as to learn more about major drivers of change in the livestock systems in the area.

In this context, we identified innovators who were known in the area for their creativity in finding solutions for the challenges posed to local land users due to climate change, and whose efforts had been successful in terms of productivity and profitability when others failed in the same circumstances.

Group interviews took place in a workshop setting. Local land users were divided into groups. These groups gathered people with similar backgrounds and personal situations, to enable them to speak as freely as possible. These groups were based on the following types of people:

- key resource persons including village leaders (elders, clan leaders).
- male local land users, if applicable divided into a group of young, possibly landless and a group of unmarried youth, and another of married, middle-aged landowners.
- female local land users, if applicable divided between female-headed households and others.
- local land users known for high competency in adaptation for livestock.

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

It was important to make sure that the participants were comfortable being lumped into a group if necessary. In most cases it was advisable to do the group interviews with men and women separately.

What was arranged for group interviews?

- Appointments for group interviews with a balanced group of participants
- Approval letter from the administrative body and copies of research permits for officials
- Village leaders were informed.
- An appropriate setting accessible for the majority of participants (considering, for example, that women should not be far from their households)
- A convenient time for participants (also manageable for the research team to avoid delay in arrival)
- Incentives like food and drink for participants
- Facilitators understood the purpose and content of the meeting. They were sufficiently competent in facilitation to undertake this in a respectful and considerate manner. The same applied for translators.
- If possible, a notetaker and an observer

Documentation: Facilitators/notetakers had to be clear about the reporting requirements, using previously provided template forms for data entry.

- Coding list for group discussions
- Recordings: recordings plus translations/transcriptions, both with file names according to the coding list
- Table to register socio-economic details
- Table to enter data from timeline and ranking
- Digital photographs of map
- List of innovators recommended during the workshop, including contact details

Materials required: Interview guidelines, informed consent form (list), project flyer, recorder, existing village map/ resource maps if available, pens and sufficient paper, flipchart paper, notebooks, and if necessary, materials for mapping.

Program:

1. Introduction of team and participants
2. Introduction to the project, its activities, and goals
3. Explanation of program
4. Giving of informed consent and consent for recording and taking photographs. Consent was given by providing the information for the socio-economic data sheet, which had to be explained.
5. Formation of groups of ca 5-10 participants: Method I: Timelines, Method II: Mapping

Method I: Timelines

In group work, groups produced a timeline of changes in the village over the last 30 years, indicating important events, then inserting events that people related to climate change, and noting when certain adaptation practices began. They probed into the reasons for adaptations, who brought them or how they developed in the area, and who was able to adopt and implement them. If there were significant differences between the timelines produced by different groups, we followed up immediately to find out the reason.

Output: Timeline differentiating responses to climate change and other types of environmental crises

Method II: Mapping

We used existing village maps if available. We looked at the map and went through the different areas to help respondents to remember the people living in different parts of the village and what their activities were in terms of adaptation for livestock. (IFAD 2009; Irwin et al. 2015)

Objectives of mapping:

- Identify land use and natural resource availability in relation to livestock (fenced/non-fenced grazing, fodder crops)
- Indicate the location of successful adaptation practices (and/or maladaptation) and the local land users responsible for them

Output: Resource map showing natural and social resources, climate change hot spots, and adaptation practices (indicating where the innovators are). Basis for a list of local land users who are seen as innovators and their adaptation practices relevant for livestock.

Deliverables: Timeline documentation, photograph of map, list of socio-economic details for respondents, recordings and translated transcription of the interviews.

Data collection stage II: Visiting local land users for documentation of adaptation practices

Interviewing local land users

This stage of the scoping study served to give us more information about those local land users in the project area who were seen by others as 'innovators'. The purpose of interviewing them was to identify those among the so-called 'innovators' who were 'positive deviants' in terms of how they implemented adaptation practices. We looked at how successful they were in terms of securing their livelihoods, and whether they had gotten to this stage because of their own strategies, behaviours, and motivations, or whether they had been supported by projects and governments. We wanted to understand which adaptation practices they implemented in their livestock systems, which innovations they were applying in response to climate-driven stressors, and which conditions and characteristics helped to explain their implementation.

Sample selection:

At this stage, we already had a purposively selected list of innovators nominated by the people who had participated in the workshops described above. The actual sample size was determined by the number of included households at the different sites. It was expected to average about 10% of the population. If only male local land users were nominated as innovators, we triangulated with female respondents to determine whether this was accurate.[1] At the same time, the interviewers attempted to interview one male and one female household member to incorporate different views, experiences, and knowledge held by both male and female household members.

Interviewing innovators

- Semi-structured interviews included an introduction and informed consent, and agreement on confidentiality and intellectual property rights for local land users' innovations.
- Interviewers engaged in a transect walk on, and carried out a resource map/ livelihood analysis for, each farm. If applicable, they built on previous maps, e.g. on the map of Debre Birhan by Kuria et al. (2014).
- Interviewers observed adaptation practices (see VIII Guidelines for Observation).

Documentation:

- Coding list for interviews

[1] Care was taken to avoid bias, as it was likely that during the group interviews some innovators had been omitted, and others were brought into the picture who were not actual innovators. While it was perfectly reasonable that some model farmers would be innovators, it was unlikely that *only* model farmers would be innovators.

- Recordings plus translations/transcriptions, both with file names according to the coding list
- Table to register socio-economic details
- Table to enter data from ranking of adaptation practices
- Digital photographs or scans of resource maps
- List of innovators recommended during the workshop, including contact details (as opposed to those actually interviewed)

Output:

- Documentation of household's livestock diversity, market orientation, household decision-making, off-farm income, resource requirements, access to training, sources of information, relation to extension, social capital, and other factors
- Documentation of adaptation practices already being implemented, and emerging innovations
- Preliminary characteristics driving the implementation of adaptation practices
- Preliminary indicators for participatory adaptation analysis

Deliverables:

- List of ranked adaptation practices
- List of codes for interviews
- List of socio-economic details for respondents
- Recordings and translated transcriptions of interviews
- Photographs or scans of resource maps
- Observation notes

Managing and storing data

The people analysing the data may not be the same as those who collect it (Johnson et al. 2010). Therefore, the team had to follow a clear and coherent system for managing and storing data. For each site, a coordinator was appointed who was in charge of collecting data from the first-hand data collectors. This coordinator was responsible for ensuring adherence to a coherent filing system as well as completeness of the required data according t the list of deliverables shared with the data collectors. All submitted files had be recorded in a spreadsheet to keep track of the data. 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
- Location
- Date
- Type of interview (key informant, local innovator, group discussion)

The file names followed the coding system and were required to be consistent for all files saved:

- Recordings
- Photographs
- Maps and other illustrations
- Transcripts
- Observation notes

The coding scheme was as follows:

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 name the interviewer each time)

Examples:

- ETH-GB-LI-FHH-1-EG: Ethiopia, Gudo Beret (village), local innovator, female-headed-household number 1, interviewer Elisabeth Getahun
- KEN-MOS-LIf-2: Kenya, Mosop, local innovator 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, local innovator male, number 3. Here all women were interviewed by the same person, so it was not necessary to identify him.

STEP 2: The coding list and the list of socio-economic data were coherent and all information was there, with matching names and codes. We made sure to find out if there was a family relationship between the respondents, e.g. spouses. All the Excel files required coherent naming and formatting as well, and they were processed in SPSS / STATA or a similar program.

STEP 3: All the original submitted documents were saved in one folder per site. Subfolders were created for recordings, photos, transcripts and other categories.

- Submitted files were cleaned of unnecessary information (e.g. moving the socio-economic data to an Excel file and out of the actual data file).
- We ensured that consistent terms were used, for example local language names for places, crops, and fodder. For Ethiopia, we created a glossary for frequently used terms in the Amharic language.
- We made sure there was a consistent use of codes for interviewers and respondents (and we cross-checked this with the socio-economic data list).
- We ensured that files and data were formatted as agreed.
- We checked dates and places for accuracy.

STEP 4: Within the team we made sure that we all shared the same dataset to avoid data loss or duplication.

At this point we reminded site coordinators to get equipment back from the data collectors, such as digital recorders, copies/photographs of all data stored on paper, attendance sheets, SE data records, maps and any other drawings, and tables done on flipcharts.

Data analysis

Written documents

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 program NVIVO was used for the analysis.

Visualisations

The timeline and all mapping exercises (amendments on existing village maps, new maps, and resource maps) were digitalised and included in coding.

Quantification of qualitative data

The results of the ranking exercises were quantified and processed.

Data management strategy

Data were handled confidentially. They were stored in the researcher's laptop and in a secure place at ILRI. The identity of participants was not stored in direct association with the data they had provided. Only the researchers involved in the project had full access to the data and identity codes.

General guidelines for qualitative research

The quality and validity of qualitative research depends to a large extent on the person asking the questions. Therefore, this research adhered to the following guidelines:

- Avoid leading questions that allow for only a yes or no answer.
- Avoid lecturing and providing the answers.
- Keep your language simple, without jargon (no English words, only local language!), and speak in clear sentences.
- Be patient when your questions are not understood immediately. Take your time, sit back, and rephrase your question.
- Be comfortable with silence or refusal to answer. This means either that the other person is thinking about what you asked, or that he or she is not comfortable answering right now. In that case, leave the thought with them as it is. Don't push or force.
- Commit and keep your promises: Be on time and apologise in advance if you cannot make it.
- Delegate responsibility to the farmer until you have your next meeting, for example talking to the mentor or to someone else who is working on a technology he is interested in. Create ownership.
- Recount at the next meeting what happened in the meantime. Keep your own promises and bring with you what you promised to.

Sometimes it was more important to listen rather than rephrase the same question again and again to get to the answer we were looking for. Across the qualitative data collection activities, this research was rooted in the following principles of good listening (Pretty et al. 1995):

- Remain silent and let the others talk.
- Acknowledge by making appreciative sounds and short comments like 'I see'.
- Invite people to expand: 'Tell me about it…', 'I'd like to hear more about that…'.
- Paraphrase: 'So you are saying that this year was a good year because….'.
- Active listening: Describe your impression of what has been said and the feelings you observed, e.g.
    - 'I have the impression that you are upset about…';
    - 'It seems to me that you are unsure about what to do next…';
    - or if the person keeps silent, 'I have the feeling that you are anxious and upset'.
- Provide accurate information, such as when your next meeting will be held.

- Stay neutral and control your own emotions.
- Hide scepticism and your own opinion.
- Deal with criticism in a neutral way. Do not become self-defensive, but rather accept, along the lines of
    - 'Thank you for pointing this out to me. I will certainly consider what you have told me and try to improve.',
    - or sentences like 'I agree….', 'I appreciate….'.

When phrasing questions, we took care to use open-ended, not leading questions. Questions were written to be succinct and easily understood, and we avoided the temptation to code answers, choices, and examples in the question. Probes were used to encourage respondents to elaborate on responses that were overly broad.

Examples:

- Leading question: Would you like to have seeds for an improved wheat variety?
- Alternative: What are your plans for this year regarding crops? What do you need to implement these plans? How can I assist you in realising this?
- Leading question: Did your farm suffer from effects of climate change like drought or flood last year or the year before?
- Alternative: What changes have you made in your agricultural practice in the last few years? What triggered these changes? What made you select different pathways?

Appendix

I Literature review catalogue

To be documented for each paper:

1. Number
2. File Name
3. Author
4. Article Title
5. Issues Addressed
6. Problem Statement
7. Methodological Philosophy
8. Research Method
9. Findings (in relation to past research)
10. Remarks

If applicable for adaptation practices (APs):

1. Number of publication
2. Short description of AP
3. Resources needed for AP
4. Where resources came from
5. Where and/or whom AP came from
6. Whether AP is traditional, endogenous, modern, imported, or a blend
7. Main actors driving the innovation (AP)
8. What made them successful (as individuals or groups)
9. Methods used to assess success of the AP

10. Lessons learned for participatory adaptation analysis
11. Other important lessons or criteria

And for participatory adaptation analysis:

1. Number of publication
2. Approach
3. Aim
4. Activities
5. Selection of practice
6. Criteria for evaluation
7. Criteria for selecting field sites
8. Criteria for selecting farmers
9. Actors involved in selection
10. Extent of interference by researchers
11. Task of farmers
12. Duration/length of implementation

II Field site parameter overview

Country	
Site Name	Site ID
Sampling Frame Name	Sampling Frame ID
Location	Sampling Frame Coordinates (UTM)
Elevation range (m)	Agro-ecological zone
Mean annual rainfall (mm)	Dominant soil type(s)
Population size of unit	Number of households of unit
Total area of unit (ha)	Livestock densities (TLU/ha)
Farming and Livelihood Systems	
Major livestock (cattle, sheep, other)	Major crops

Country
Key Challenges
Research planned in the area
Key partners in the area [incl. contact details]
Other important notes

III Key informants: Semi-structured interview guidelines

1. Information about project

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.

2. Informed consent

Provide two copies of the informed consent form, one for the respondent and one for yourself. Only start recording after you have explained its contents and obtained approval. The signature can be obtained at the beginning or end of the interview; however, respondents often feel more comfortable signing at the end.

3. Socioeconomic Details

1. Name of the location: _____
2. Interviewer: _____
3. Date: _____
4. Respondent's name: _____
5. Male___ Female ___
6. Age: _____
7. Role/job description: _____
8. Level of education completed _____
9. Length of time served in this location: _____ years

4. Main part

1. In your opinion, what are the main challenges in this area regarding climate change and livestock?
2. How have you been responding to these challenges in your work with local land users in this district?
3. How have local land users been responding to these challenges?
4. What can you do to support local land users in these efforts? [probe to find out information on interventions/ trainings offered, credit access, site visits, or demonstration farms]
5. Which adaptation practices are you familiar with in relation to livestock that are
    a. promoted by your office/organization?
    b. implemented by local land users? [Probe whether local land users came up with these by themselves or adopted them; probe also on possible maladaptation.]
6. The adaptation practices in relation to livestock mentioned so far were….
    a. .....
    b. .....
    c. .....
    d. .....
    e. .....
    f. .....
    g. .....
    h. .....
    i. .....
    j. .....
    k. .....

Please rank them in order of relevance from their point of view [and probe to find out what he/she is thinking of, whether environmental, developmental, or something else].

1. What is the reason people have started implementing these adaptation practices?
2. Do you know of any local land users that have been applying such adaptation practices successfully?
3. Are you aware of cases of maladaptation?
4. Which of these adaptation practices in relation to livestock have been addressed by projects operational in the area?
5. Which other projects are you aware of that are addressing related issues?

Ask for any accessible reports and statistics on the district and the study site. **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. If applicable, ask for his/her support in project implementation (e.g. introduction to important partners, a letter of support to access the study site, or introduction to leadership).

IV Informed consent (include your organization's logo/letterhead on this form)

Programme for Climate-Smart Livestock Systems

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 Programme 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, farmer meetings, or workshops. Field days will be carried out to highlight, among other things, farmers' positive contribution to mitigating the effects of climate change through successful adaptation.

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 duration of 4 years, 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 that 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.

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 or partner websites and remain there for an indefinite number of years.

Voluntary participation

Participating in this 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 my consent (discussant/respondent) to the publication of these materials (films, photographs, audio recordings, or images of me) will not lead to me receiving any monies or gifts now or in the future unless specified by ILRI.

Approval of the research

The research has been approved by ….

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

Contact details

For questions regarding this study, please contact any of the following
Name/Telephone/Email

For questions regarding participation rights and welfare, please contact
Name/Telephone/Email

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 consent voluntarily 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_____

V Group interview guidelines

COMMUNITY LEVEL LOCAL LAND USERS, VILLAGE ELDERS/CLAN LEADERS, LOCAL BUSINESSMEN, RELIGIOUS LEADERS…

The following form is adapted from Petesch et al. (2018). It should be filled in for each group separately.

Group name: ……(local categorisation)

Male ____ Female ____

Name of the community: _____

Facilitator: _____ Note Taker :_____

Date: _____

Group members (family name not needed)	Age	Relationship to Household Head	Marital Status**	Level of education completed***	# of children	# of household members	Primary Occupation	Secondary Occupation
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

**In the women's roster, if polygamy is practiced in the community, it may be useful to specify the order of marriage for wives in polygamous households.

***Please create a coding list for primary, secondary, and tertiary levels of education in your country.

Semi-structured interview guidelines for group interviews (adapted from Petesch et al. 2018)

Thank you for joining us today. We are going to be discussing the environmental and climate-change-related challenges that you have been facing over the last 30 years. (Develop time indicators with key informants before the group interview that help people to correlate their memories with historic events of local relevance.) We will also be looking at processes by which men and women here have found ways to respond to these challenges in terms of adaptation practices in livestock farming, and what made them successful in doing so.

INFORMED CONSENT

This group discussion is part of a large study being conducted with separate groups of women and men here in the community and elsewhere in the country, as well as in Kenya and Uganda. The topic of the study is climate-smart livestock. We are particularly interested in how local land users can adapt to their changing environment in more productive and profitable ways.

Your participation today is voluntary and confidential. We will not be using your names in any publication with the information that we collect today. We would like your permission to record the discussion so that we can document your views and experiences accurately. If you prefer that we do not record the session, however, we will not do so.

We request that you respect the confidentially of the others participating today by not repeating outside this room anything that was said during the discussion. We hope that each of you will feel free to express your opinions fully and share your own experiences with the topics that we will be discussing. You are of course each free to not answer any question and to leave the discussion whenever you like. However, we very much hope you remain for the entire discussion and enjoy reflecting on many of our questions. Your views and experiences are very important to us. We cannot promise that you and your community will benefit directly from this study, but the information that we are collecting will help to improve agricultural research and development activities in your country and in other countries.

- Are there any questions before we begin?
- If you agree with the above, we will proceed with the interview.

Workshop: Group interviews

Method I: Timeline

1. Let us start with defining important new practices and activities affecting livestock over the last 30 years that all of you remember in good or bad ways.
    - 30 years ago was the time when….
    - 20 years ago was the time when….
    - 10 years ago was the time when…
    - 5 years ago was the time when….
2. Which of the new practices that you mentioned would you relate to climate change, or to other environmental changes (name which and why they are relevant)?
3. When did people start to realise that things were changing? Who was talking about this more than others?
4. Which of these new adaptation practices have been the most important for the male/female/young livestock keepers in the community in terms of people's livelihoods? Why are these important?
5. Was the highest-ranked adaptation practice rapidly adopted by local people, or were there any problems with its uptake? Why?

New livestock-related or NRM practices	Most important for the females of the community	Most important for the males of the community	Most important for the youth of the community

6. Now we're going to explore in greater detail the adaptation practice mentioned above.
    - Tell me who were the first people to learn about and try out this new practice in the village.
    - What different places can a male/female livestock keeper from this village turn to for information about new agricultural practices?
    - Have any local men or women tried out new ways to make this adaptation practice work better here? Please tell me about this.
    - Are there any formal or informal groups of people who are working together on this adaptation practice? If so, tell me about the group and its members and activities.
    - How successful were people in applying these adaptation practices? What made some people more or less successful than others and why? [successful in terms of improvements of livelihoods and sustainability]
7. Which cases do you know where adaptation has had negative consequences? When did that happen?

After comparing the different timelines, if there are significant differences between the timelines, follow up immediately to find out the reason for the differences.

Method II: Mapping

We will use existing village maps if applicable. If a map must be drawn, we will follow the guidelines of IFAD (2009) and Irwin et al. (2015). Note that participatory maps serve for more than just documenting geographical features. They also assist in pointing out social, cultural, and historical knowledge, demography, wealth, resource distribution, environmental challenges, and other factors (IFAD 2009). The facilitator therefore needs to be clear about the purpose of the exercise. As recommended by Irwin et al. (2015), the mapping team should be 'from the area, have a good rapport with the community, understand natural resource management opportunities and threats, understand the social, political and environmental context and history including the interests of different groups, and include women, in order to be able to fully take on-board their perception and interests.' Before the exercise, some discussion was needed among the team to ensure everyone had the same objective and views on how to carry out the exercise.

The quality of the map depends very much on the participants. It is recommended to have a larger group, rather than only two or three people. A lot of interesting information also emerges in the discussion among group members; issues such as conflict over resources and social disputes, as well as positive trends such as innovation, may come out during the debates triggered by mapping. In addition, whether mapping can be done with male and female participants together or whether it should be done separately depends on the context and the purpose of the map.

During map-making ensure that place names, symbols, scales, and priority features are clearly documented in a way that represents local views and perceptions (IFAD, 2009). Especially for the purpose of this research, diversity in content is more important than conformity and exactness. Therefore, we apply 'hands-on mapping' as described in IFAD (2009:13-14): community members 'draw maps from memory on the ground (ground mapping) and paper (sketch mapping). These maps represent key community-identified features on the land from a bird's eye view. They do not rely on exact measurements, a consistent scale or geo-referencing, yet they do show the relative size and position of features. […] It is a useful process for determining and extracting community views and information.'.

For the mapping exercise, the following steps are required:

- Provide the participants with enough information about the exercise. Explain the purpose and how the maps are going to be used. In this case, the map is used for the scoping study to get to know the area and where major environmental and climate-change-induced challenges occur, and also where farmers have been particularly successful in responding to these.
- Ensure broad participation. The more people participate the more accurate the information will be. Thinking things through collectively also helps in the process.
- Document who in the community is involved in map-making and which symbols and legends are being used.
- Ask people where in the community they are from themselves.

Introduction: We are asking you to make this village resource map with us so that we can get a better understanding of your village and the area around it. We would like to understand where the major environmental and climate-change-induced challenges occur, and where farmers have been particularly successful in responding to these.

Questions to be asked:

- Please explain the different areas of the village to us. Which areas have been affected by the type of environmental and climate-related changes that you mentioned earlier?
- Which areas can you identify on this map that are important for livestock (fenced/non-fenced grazing, fodder crops)?
- Where on this map can we find examples of successful adaptation practices that you have mentioned earlier (maladaptation can always be indicated as well)?
- Who are the local livestock keepers responsible for these adaptation practices?

At the end of the exercise, verify the following points with participants (IFAD 2009:37):

- Should more information be included?
- Is any information incomplete?
- Is the information displayed accurate?
- What are the most important features represented on the map?
- What areas need to be improved or addressed?
- If genders were separated, what would be the main differences represented on the maps and why do you think this is?

At the end you should have a list of local innovators. If not, you must ask them again!

Thank them for the interview, the time, and the information provided. Explain what the project will do next, and how they can get in touch with us.

VI Farmers: Local innovators semi-structured interview guidelines

1. Information about project

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.

2. Informed consent

Written consent: Provide two copies of the informed consent form, one for the respondent and one for yourself. Only start recording after you have explained its contents and obtained approval. The signature can be obtained at the beginning or end of the interview; however, respondents often feel more comfortable signing at the end.

Oral consent: Explain the content of the informed consent form. Record the agreement on tape, but only start recording after you have explained its contents.

3. Socioeconomic Details

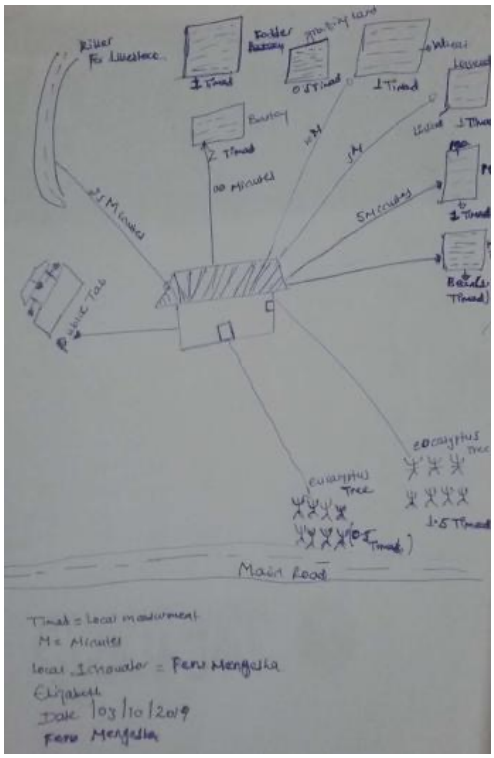
1. Name of the community: _____
2. Interviewer: _____
3. Date: _____
4. Respondent's name: _____
5. Male ___ Female ___
6. Age: _____
7. Relationship to household head _____
8. Marital status _____
   (If in a polygamous household: number of co-wives _____)
9. Level of education completed _____
10. Number of children: _____
    Ages of youngest and oldest: _____ - _____

11. Primary occupation _____ _____

12. Secondary occupation _____-_____

13. Length of time lived in the community: _____ years

Main part: While you are doing the interview, start making a sketch map of the farm. This map should contain the approximate location of the plot and indicate how far the plot/grazing area is from the farm as well as the approximate herd size and area covered by the farm (in local measurements).



See example from Gudo Beret, Amhara Region, Ethiopia (drawn by Elisabeth Getahun):

1. Please tell us about your farm. What type of farm is it and what is the main economic focus of your farm (livestock, crops)?

2. Please tell us how much farmland you have in different categories (crops, grazing, forest)?

3. Please tell us how much livestock you keep (differentiate between free-grazing and housekeeping).

4. What are the main sources of fodder?

5. How do you manage manure?

6. How much is used on the farm and how much is sold?

7. What inputs (like fertilisers or feed supplements) do you buy for your farm?

8. How do you manage labour on your farm; who is doing which jobs?

9. How does household-level decision-making work in your household?

10. What changes have you made on your farm?

11. Which new practices have you tried out with regard to livestock?

12. Why did you do that? *(probe for more information on climate change and environmental changes)*

13. Who else did something like this?

14. List the adaptation practices in relation to livestock:

    a. .....

    b. .....

    c. .....

    d. .....

    e. .....

    f. .....

    g. .....

    h. .....

    i. .....

    j. .....

    k. .....

    l. .....

    m. .....

    N. .....

Rank these in order of importance from your personal perspective.

1. More about the adaptation practices:

    a. What support did you receive from others in implementing these adaptation practices?

    b. Which of these adaptation practices in relation to livestock have been addressed by the government and/or projects operational in the area?

    c. What adaptation practices are you aware of that have had negative consequences?

2. In your opinion, what are the main challenges in this area with regard to climate change and livestock?

Transect walk: At this point, you suggest that you take a walk on the farmland together with the livestock keeper. Ask him/her to show you the livestock, where it is kept, where it is grazing, where he/she is growing the fodder for the livestock, and so on. Topics to be addressed are:

- Livestock.
- Places relevant to livestock like the barn, the pastures, the field with fodder.
- Feeding trough and feed storage.
- Watering points for animals.

Take notes either on the resource map or by recording if the conversation becomes more extensive.

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.

VII Agro-pastoralists: Local innovators semi-structured interview guidelines

1. Information about project

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.

2. Informed consent

Written consent: Provide two copies of the informed consent form, one for the respondent and one for yourself. Only start recording after you have explained its contents and obtained approval. The signature can be obtained at the beginning or end of the interview; however, respondents often feel more comfortable signing at the end.

Oral consent: Explain the content of the informed consent form. Record the agreement on tape, but only start recording after you have explained its contents.

3. Socioeconomic Details

1. Name of the community: _____

1. Interviewer: _____ Date: _____

2. Respondent's name: _____

4. Contact details:

    a. Name of village _____Telephone number _____

    b. Name of spouse (husband / wife) _____

    c. Name of eldest child _____

5. Male ___ Female ___

6. Age: _____

7. Relationship to household head _____

8. Marital status _____
   (If in a polygamous household: number of co-wives _____)

9. Level of education completed _____

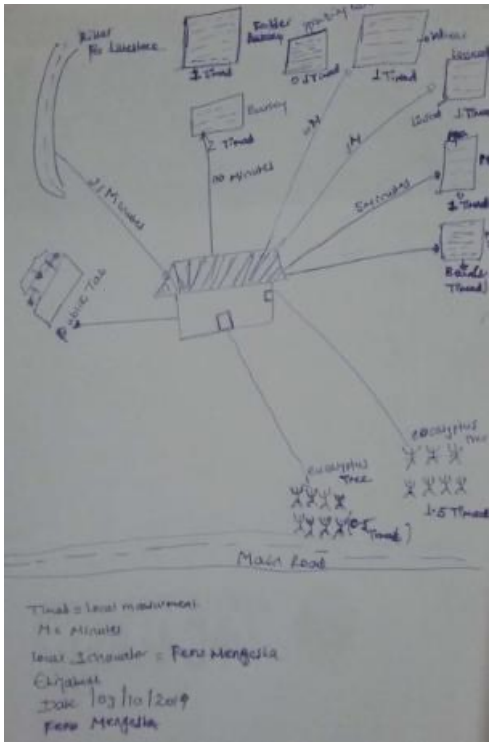
10. Number of children: _____
    Ages of youngest and oldest: _____ - _____

11. Primary occupation _____ _____

12. Secondary occupation _____-_____

13. Length of time lived in the community: _____ years

4. Main part:



While you are doing the interview, start making a sketch map of the homestead and surrounding areas. This map should contain the approximate location of the plot, and indicate how far the plot/grazing area is from the homestead as well as the approximate herd size and area covered (in local measurements).

See here an example from Gudo Beret, Amhara Region, Ethiopia (drawn by Elisabeth Getahun):

1. Would you describe yourself as a:

a. Pastoralist

b. Agropastoralist

c. Farmer

d. Other: _____

2. Please describe for us your main source of income.

3. What kind of livestock do you keep? (Cattle, sheep, goat, camel)

4. How many do you keep in each category?

5. Why do you prefer cattle/sheep/goats/camels?

6. How much land do you keep for free grazing and how much do you keep with the house?

7. Why do you do it like this?

8. What income do you derive from each of these livestock types? (milk, meat, other animal products like processed milk or leather)

9. Where do you find your main markets?

10. Who is buying the products there?

11. For agro-pastoralists and farmers only:

    a. Please tell us about your farm. What type of farm is it; what is the main economic focus of your farm (livestock, crops)?

    b. Please tell us how much farmland you have in different categories (crops, grazing, forest)?

12. Where do you get water for your animals?

13. What do you feed your animals (in the different categories: camels, cattle, goats, sheep)?

14. What feed do you buy for your animals and where do you get it?

15. What are your emergency feed source for your animals? (Leaves from trees, government relief, buying from the market)?

16. For agro-pastoralists and pastoralists only: Please describe your migration pattern.

    a. At which time of year do you go to other places?

    b. How many times and for how long each time?

    c. Where do you go and why do you choose this place?

d. What differences are there year by year?

e. Who leaves and who stays behind? (This applies to both humans and livestock, because if humans stay behind some of the livestock will do so as well.)

17. How do you manage manure?

a. How do you collect manure?

b. How do you store it?

c. How much is used on your own land?

d. How much is sold?

e. What other purposes do you use it for (besides fertilization)?

18. What inputs (like fertilisers or feed supplements) do you buy? Where can you get these?

19. How do you manage labour on your farm; who is doing which jobs? (Ask what the women and men are doing, as well as the children and other people like labourers.)

20. Where do your labourers come from?

21. How does household-level decision-making work in your household?

22. What changes have you made in livestock management?

23. Which new practices have you tried out with regard to livestock?

24. Why did you do that? *(Probe for more information on climate change and environmental changes.)*

25. What has personally motivated you to do things differently from others?

26. Who else did something like this?

27. Rank the adaptation practices that you have mentioned so far in order of importance for your livelihood from your personal perspective.

28. More about the adaptation practices:

    a. What support did you receive from others in implementing these adaptation practices?

    b. Which of these adaptation practices in relation to livestock have been addressed by the government and/or projects operational in the area?

    c. What adaptation practices are you aware of that have had negative consequences?

29. In your opinion, what are the main challenges in this area regarding climate change and livestock?

Transect walk: At this point, you suggest that you take a walk on the farmland together with the livestock keeper. Ask him/her to show you the livestock, where it is kept, where it is grazing, where he/she is growing the fodder for the livestock, and so on. Topics to be addressed are:

a. Livestock.

b. Places relevant to livestock like the barn, the pastures, the field with fodder.

c. Feeding trough and feed storage.

d. Watering points for animals.

Take notes either on the resource map or by recording if the conversation becomes more extensive.

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.

VIII Guidelines for observation

(Non-participant) observation will be applied to the social worlds of local land users to learn more about their perspectives and lifeworlds. It will take place during field visits to field sites and villages, when visiting farming communities.

(Non-participant) observation will be ethnographically documented by notetaking: in doing so we will focus on three aspects (Gobo 2008): social structures, explanations given by other participants, and the context of the action. In the setting, there are also extra-situational contexts that are organizational, normative, social, political, and economic. Together with other methods (see above), observation will help us understand which social institutions become important in villages, which social structures exist in villages, and who the main actors are.

1. Non-participant observation of physical structures, social differences, behaviour, actions, and symbols:

Provides information to develop central questions. The researcher observes without interaction and tries not to influence people's behaviour (Mikkelsen 2005; Gobo 2008). This is difficult to achieve in this research, however, because in most cases our presence alone will already have some influence on people's behaviour.

Documentation: by note-taking and writing reflective observation protocols afterwards to be discussed in meetings

2. Participant observation:

This involves long-term observation, using key informants, doing case studies, gathering secondary data, and more, and requires prolonged contact and stays in communities: it therefore requires careful preparation and study of the method,

as well as good language skills on part of the researcher. It helps us understand the context of complex situations, and when trust must be established between the researcher and respondents (Kane and O'Reilly-De Brun 2001; Bernard 2002; Mikkelsen 2005; Gobo 2008).

This method becomes particularly important when visiting farming communities to observe the work of farmers and the social structures in villages. While this method will rarely be applicable, due to the nature of this research that enables only short visits, researchers in this project are nevertheless encouraged to participate actively if appropriate and welcome by local land users.

Documentation: by note-taking and writing reflective observation protocols; includes comments and personal perceptions of the observed dialogues

Observation notes: These are notes taken after the interview and transect walk. They can be supplemented with photographs.

Topics for observation:

- Personal perceptions of the observed dialogues
- Statements that reveal possible effects of climate change in the area (drought, flooding, wind)
- Cause and effect; these must be carefully distinguished because often, people relate general environmental changes to climate change if they assume that this is what we want to hear.
- Innovative farming practices and adaptation practices linked to climate change:
    - observe how local land users are implementing these practices,
    - who is involved,
    - which resources are required,
    - whether other local land users are doing the same,
    - whether they learn from each other,
    - whether it is successful, and what the outcomes are.
- What is going on at other farms
- Other positive deviants not mentioned during group discussions, and why they were not mentioned

References

Adelhart Toorop, R., Ceccarelli, V., Bijarniya, D., Jat, M.L., Jat, R.K., et al. 2020. Using a positive deviance approach to inform farming systems redesign: A case study from Bihar, India. *Agricultural Systems* 185. doi: https://doi.org/10.1016/j.agsy.2020.102942

Albanna, B. and Heeks, R. 2019. Positive deviance, big data, and development: A systematic literature review. *The Electronic Journal of Information Systems in Developing Countries* 85(1). doi:10.1002/isd2.12063

Bernard, R. H. 2002. *Research Methods in Anthropology. Qualitative and Quantitative Methods*, 3rd ed. Walnut Creek, USA: AltaMira Press.

Birhanu, M.Y., Girma, A. and Puskur, R. 2017. Determinants of success and intensity of livestock feed technologies use in Ethiopia: Evidence from a positive deviance perspective. *Technological Forecasting and Social Change* 115: 15–25. doi:10.1016/j.techfore.2016.09.010

Crane, T.A., Roncoli, C. and Hoogenboom, G. 2011. Adaptation to climate change and climate variability: The importance of understanding agriculture as performance. *NJAS - Wageningen Journal of Life Sciences* 57(3–4): 179–185.

Gobo, G. 2008. *Doing Ethnography*. London: SAGE Publications.

Hammond, J., Fraval, S., van Etten, J., Suchini, J.G., Mercado, L. et al. 2017. The Rural Household Multi-Indicator Survey (RHoMIS) for rapid characterisation of households to inform climate smart agriculture interventions: Description and applications in East Africa and Central America. *Agricultural Systems* 151: 225–233. doi:10.1016/j.agsy.2016.05.003

IFAD (International Fund for Agricultural Development). 2009. *Good practices in participatory mapping A review prepared for the International Fund for Agricultural Development (IFAD).* Rome, Italy. https://www.ifad.org/documents/38714170/39144386/PM_web.pdf/7c1eda69-8205-4c31-8912-3c25d6f90055

Irwin, B., Cullis, A. and Flintan, F. 2015. Mapping guidelines for participatory rangeland management in pastoral and agro-pastoral areas. Addis Ababa, Ethiopia: CARE. https://hdl.handle.net/10568/105639

Johnson, B.D., Dunlap, E. and Benoit, E. 2010. Organizing 'mountains of words' for data analysis, both qualitative and quantitative. *Substance Use & Misuse* 45(5): 648–670.

Kane, E., and O'Reilly-De Brun, M. 2001. *Doing your own research.* London-New York: Marion Boyars Publishers.

Khatri-Chhetri, A., Aggarwal, P.K., Joshi, P.K. and Vyas, S. 2017. Farmers' prioritization of climate-smart agriculture (CSA) technologies. *Agricultural Systems* 151: 184–191. doi:10.1016/j.agsy.2016.10.005

Kuria, A., Lamond, G., Pagella, T., Gebrekirstos, A., Hadgu, K. et al. 2014. *Africa RISING project: Local knowledge of farmers on opportunities and constraints to sustainable intensification of crop-livestock-trees mixed systems in Basona Woreda, Amhara Region, Ethiopian Highlands.* Nairobi, Kenya: World Agroforestry Centre (ICRAF). doi:10.34725/DVN/25292. https://data.worldagroforestry.org/dataset.xhtml?persistentId=doi:10.34725/DVN/25292

Lapping, K., Marsh, D.R., Rosenbaum, J., Swedberg, E., Sternin, J. et al. 2016. The positive deviance approach: Challenges and opportunities for the future. *Food and Nutrition Bulletin* 23(4) _suppl2: 128–135. doi:10.1177/15648265020234s217

Mikkelsen, B. 2005. *Methods for development work and research. A new guide for practitioners.* (2nd ed.). New Delhi: Sage Publications India Pvt Ltd.

Miles, M.B. and Hubermann, A.M. 1994. *An expanded sourcebook: Qualitative data analysis.* Thousand Oaks, USA: Sage Publications.

Petesch, P., Badstue, L. and Prain, G. 2018. *Gender norms, agency, and innovation in agriculture and natural resource management: The GENNOVATE methodology.* Mexico City, Mexico: International Maize and Wheat Improvement Center (CIMMYT). https://hdl.handle.net/10883/19635

Pretty, J.N., Gujit, I., Scoones, I. and Thompson, J.N. 1995. *A trainer's guide for participatory learning and action*. London, UK: IIED. https://pubs.iied.org/6021iied

Spreitzer, G.M. and Sonenshein, S. 2016. Toward the construct definition of positive deviance. *American Behavioral Scientist* 47(6): 828–847. doi:10.1177/0002764203260212

Steinke, J., Mgimiloko, M.G., Graef, F., Hammond, J., van Wijk, M.T. et al. 2019. Prioritizing options for multi-objective agricultural development through the Positive Deviance approach. *PLoS One, 14,* 2. doi:10.1371/journal.pone.0212926

Thornton, P.K., van de Steeg, J., Notenbaert, A. and Herrero, M. 2009. The impacts of climate change on livestock and livestock systems in developing countries: A review of what we know and what we need to know. *Agricultural Systems* 101(3): 113-127. doi:10.1016/j.agsy.2009.05.002

Vogl, C. R., Vogl-Lukasser, B. and Puri, R.K. 2016. Tools and methods for data collection in ethnobotanical studies of homegardens. *Field Methods* 16(3): 285–306. doi:10.1177/1525822x04266844

Zeitlin, M. 1991. Nutritional resilience in a hostile environment: positive deviance in child nutrition. *Nutrition Reviews* 49(9): 259–268. doi:10.1111/j.1753–4887.1991.tb07417.x

92–9146–687–6

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