TPP project: Socio-economic viability of Agroecological Practices across Africa

Common integrated methods protocol – Steps 1 to 6

Project Methods Group[1], 01 March 2021

[1] Contact Nadine Andrieu (nadine.andrieu@cirad.fr) or Ric Coe (r.coe@cgiar.org)

Contents

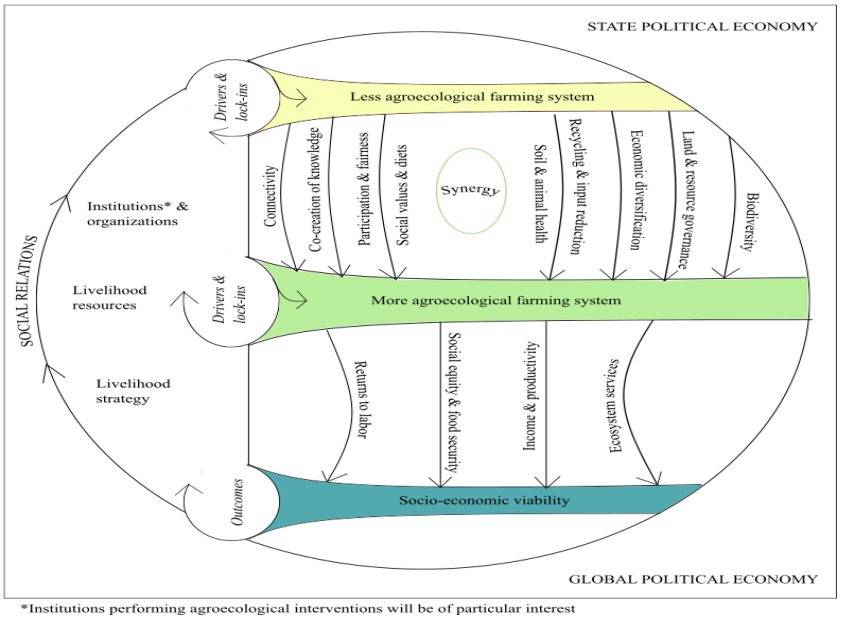
Introduction

The approach used in the project is based on sequential data collection and analysis from the Case Study (CS) team, key informants, groups and individuals. See the Common Protocol Summary document for the overall concept and logic of the data collection

Each of these steps generates data for

- Exploring project objectives and hypotheses
- Designing the details of subsequent steps

Each of these steps provides a specific and complementary perspective on the conceptual frame presented in the summary document.



*Institutions performing agroecological interventions will be of particular interest

This document aims to present the methods for **Steps 1 to 5,** and how they can be adapted to the specifics of each case study. Step 6 will be added soon. Steps 7, 8 and 9 will be designed in response to experience with these first steps and will be described later.

For each step we describe the

1. The specific objective and contributions to examining hypotheses
2. The link to other steps.
3. The data collection process.
4. The process for piloting/translating/ localising and training.
5. The data processing, analysis and reporting methods.

For all steps there will be a common data platform for all case study teams to use. This will facilitate data handling, support data analysis both within and across case studies and allow the data sharing agreements to be operationalised.

Given the covid-19 context, priority will be given to the health of surveyed people and to the compliance to the sanitarian rules of the countries. Hence in each step, we need to check that all mandatory measures for Covid-19 protection of data collectors and study participants are being taken.

Step 1 Delineate case study

Specific objectives

Step 1 aims to delineate and described the overall geographical locations of the case study. It is anticipated that CS teams will have this information readily available, and some was included when the CS was proposed. This step also compiles existing reports and publications relevant to the case study.

Data collection process

A first description of the case study has been initially shared to the steering committee of the Viability project by the case study leaders. In this step, the initial description of the case study will be updated and clarified based on meetings with the members of the case study team.

A Study Site is a bounded area containing the population of farms that will be studied in the CS. A CS may have one or several study sites. The information needed about each study site is described in the tables below.

Table 1 Site name and location

Name of the study site	Provide a name for each site for easy reference
Boundaries of the study site	Provide a GIS layer with the outline of study site (Climate, land cover, etc data can be retrieved from geospatial databases once these are provided)
Approximate location	A verbal description of where the site is

Table 2 Agricultural context

Scale	Topic	
General area	Agro-ecozone Dominant agricultural systems Trends in agriculture Past or current policies influencing observed trends Position of agroecology	Brief qualitative descriptions under each heading
Specific project site	Topography Landuse and LU history	Brief verbal descriptions under each heading

	Typical farm size
	Typical land tenure
	Role of livestock
	Demography
	Employment and local economy
	Trends in the above over the last 10 years

Table 3 Project or intervention description

Project or intervention	Brief description
Name of the project that is the basis of the case study	Max 1 paragraph that summarises the focus of the project and the nature of any interventions (eg practices introduced)

Data processing, analysis and reporting methods

Report data in Tables 1, 2 and 3 along with the GIS polygons.

Provide copies of any reports and publications that describe the case study project and have not already been submitted with the proposal.

Step 2: Expert or Key Informant interviews on viability of agroecological practices

Specific objectives

In Step 2 the aim is to gain insights into the objectives of the project, explore the hypotheses and provide local information needed to design later steps. For these aims, information is needed on:

- The context of the case study area, including the main characteristics of family farms with the policy, institutional and market situations in which they operate.
- The agroecological trajectories in the case study area. This includes recent and current changes in agroecological practices and the main policies and interventions promoting them.
- Perceptions of the social, economic and environmental viability of agroecological practices, their drivers and lock-ins.

These aims will be met through qualitative data collected from key informants in a structured way that will allow comparison across case studies and be easy to link to results from subsequent steps of each case study.

An important part of designing subsequent steps is agreeing on translations between English and local languages of critical terms. This step should allow development of consistent translations of terms and concepts.

Contribution to hypotheses

This step provides the agroecological frame within which the hypotheses will be tested, including a qualitative description of the agroecology practices being assessed by the project. It will also provide an initial look at each of the hypotheses, based views of local 'experts'.

Links to other steps

This second step will provide a basic description of the AE practices as well as the expert opinion expectations of the results. These will guide the construction of later steps. The information will also be used to triangulate results and compare results from different perspectives.

Data collection process

Identifying and selecting experts or key informants

Experts and key informants (KI) are defined as people who know the farms and people of the CS area well, whether or not they have been involved in the CS project/intervention to date and whether or not they are promoters of agroecology.

The principle criterion for being selected as a KI is having *done practical field work with farms and farmers, including interaction with farmers, in the CS area within the two last agricultural year.* The last agricultural year may has been impacted by the covid-19 context. Strive to include some people who have not been directly involved in the project/intervention around which the project is built. Other criteria for selection of key informants are:

- A mix of women and men and different age groups to bring in a range of perspectives.
- A mix of people promoting and using agroecology together with those promoting or using other pathways (eg. intensive agriculture).

Key informants should ideally include any of the following that are active in the CS area:

- Researchers (1 with a biophysical focus, 1 with an economic focus, 1 with a social science focus) from research institution of university
- Extension and/or community development workers
- Representatives of farmer's organisations
- Representatives of NGOs or activist organisations
- Representative of community watershed team if relevant for type of practice
- Local government preventatives (eg district agricultural and environmental officers, district officers working on gender and youth if possible)
- Farmers who are considered knowledgeable or experienced
- Representatives of youth-led organizations

Aim to collect data from at least two KIs in each of these categories in order to provide multiple views. In case of various sites in the case study area, some categories of KI will be duplicated (the ones exclusively involved in the given site).

Contact and permission

When contacting and requesting collaboration of KIs be sure to:

- Explain that the information will contribute to a continent-wide research project that aims to influence policy.
- Reassure them that all information collected is anonymous and answers given will not be attributed to individuals but to a category of KI (farmer, Local government representative, etc.).
- Indicate that answers given will have no consequences for the respondent and that they can refuse to answer any question or stop at any time.

- Provide your contact information so they can reach you if they have follow-up questions about the study.
- Explain that reports based on the information will be made available after the and explain how you will get these to them.

Read the Informed Consent statement and obtain verbal or written agreement (Appendix 1).

Conducting interviews

The data collection process is an individual semi-structured interview and hence should be conducted by a researcher familiar with the method and able to work in the language of the key informant whenever possible. The interviewer should understand good practice for this type of activity including such things as:

- Making and keeping appointments for the data collection
- Selecting a comfortable and private place for the interview
- Introducing themselves and the project
- Explaining the purpose and conditions of the data collection
- Obtaining consent

The semi-structured interview should proceed as a conversation, with prompts, probing and explanations as needed.

Structure and questions for the interview

The structure for the interview is based on the overall conceptual framework of the project. It therefore includes the following

- The agricultural context of the case study area, including farming systems and livelihood strategies, gender roles, structural changes, policy context and market changes
- Main drivers of agricultural and rural change conditioning dominant systems in the case study areas
- How they understand agroecology
- The interventions that have been promoting or supporting agroecology, along with those promoting other agendas
- Agroecological practices being used
- Properties and performance of these agroecological practices
- Factors that support and hinder use of these agroecological practices (drivers and lock-ins)

See Appendix 3 with guiding questions for more details.

Data collection and recording tools

The schedule for the semi-structured interview consists of

- Sections that correspond to the objectives
- Guiding questions to open discussion

- Tabular data recording forms

Information provided by interviewee is recorded as qualitative statements, as long as needed. The aim is NOT to ask the interviewee what information should be put in each box, but to use the boxes as a way of structuring responses.

Three options for recording the data are (case study teams will decide what is possible in the cultural context of the site):

1. Use two people to interview, one conducting the discussion and the other writing notes.
2. Pause the discussion at the end of each section for the interviewer to make notes
3. Make an audio recording for transcription and making notes after the interviews

After the interview, the findings should be entered by the enumerator into the tables then loaded into the data platform provided by the Viability project and ready for mid-march. The entries in the data platform will be in English for comparison across case studies. If records have to be translated into English then choose the stage at which you do that, but data in the database needs to be in English for cross-study integration

The original data recorded in the field, written or audio, should be preserved so that it can be referred to if questions arise.

Sampling scheme and size

See above for selecting key informants and the number of them needed

Process for piloting, translating, localising and training

If the key informant interviews are conducted by someone experienced with the methods then piloting and training should not be necessary. The method is inherently adaptive to local contexts and adapted by the interviewer as interviews progress.

If there are terms needed in later steps and the translations to local languages are hard, ambiguous or contentious then this step can produce an agreed list of translations. Use KIs conversant with the relevant languages to agree on translations that will be used in farmer surveys and focus group discussions in later steps.

Data processing, analysis and reporting methods

The data is recorded as 'structured open text' (see Appendix 3) to allow efficient comparison and synthesis across the key informants in one case study, and for analysis across case studies later.

Analysis will be done within each CS team to produce a qualitative summary that describes both consensus and deviation in options on each question. This will need to be done promptly after data collection to allow inputs to design of subsequent steps using the tables shared in Appendix 3. Guidance is given on this analysis in the step 3.

Step 3 Interpret information collected so far and plan next step

Specific objectives

The objectives of this step are:

- Qualitative analysis of the data collected in step 2 and particularly first exploration of the hypotheses based on KI information.
- Provide information needed to complete design of Step 4

Contribution to hypotheses

The KI information provides evidence for the hypotheses from their perspective

Links to other steps

Planning for step 4 and 6

Data processing, analysis and reporting methods

Qualitative data analysis used to summarise the information in each table and identify

- Answers to the questions asked in step 2
- Common and divergent views on each topic according to the categories of KI or gender
- Insights into the research hypotheses.

This will be combined with any existing data and previous publications to produce a report that will include:

- findings on: (1) context (2) agroecology, (3) interventions, (4) Who and why is using the practices (5) effects, benefits or implications of using the practices.
- Information needed to refine the design of Step 4 such as:
    - Lists of agroecological practices important in the study area
    - Factors that should be used as stratification variables in sampling

- Information needed to refine the design of Step 6 such as:
    - Divergent views to be resolved in FGDs

Step 4: Farm characterisation survey

Specific objectives

In Step 4 the aims are to:

- **understand the relations between practices that implement agroecological principles, other crop and livestock practices and structural characteristics of farms,**
- **characterize, in each case study area, the diversity of farms, whether or not they have received support from an AE project**.

This step focuses on the **structure and activities of the farming household** and farming practices. It will especially highlight cropping and livestock systems and the associated farming practices (non AE and AE practices specific of each case study area and possibly not being related to the AE project).

The underlying hypothesis is that structural characteristics of farms – assets, social relations, institutions and organisations – could be related to the implementation and impact of agroecological practices. Indeed, because of differences in access to assets (such as land, capital, water or labour), household economic diversification and different economic and institutional environments, the understanding of the relations between practices and structural variables and the statement of the diversity of types of farms is essential for investigating the technical and organizational patterns that generate different types of agricultural systems (integrating more or less AE practices).

There are three key issues for this step:

- Analysing **AE practices as embedded in cropping and livestock systems**, **themselves part of rural livelihoods** (for example in the case of areas with households engaged in economic diversification, rural livelihoods include off-farm or non-farm activities)
- **Within a case study**, comparing the characteristics of farms and the integration of AE practices (if the AE project was only interested in one particular type of farm in the area, the reasons should be discussed in step 6).
- For being able to make comparison **between case studies** in a rigorous way, having the same type of questionnaire for characterizing cropping and livestock systems **BUT adapted to each case study.**

These aims will be met through a survey with 100-120 farms in each strata/sub-sample in order to develop a sound full multivariate analysis (see below). But this number may be adjusted depending on case studies (number of villages and farms in the area, etc.).

In Case Studies that involve more than one site, this sample size will be needed at each site that will be analysed separately. Thus if several sites have been chosen to in order to present contrasting contexts or to cover some important gradient, it will be necessary to sample this number of farms in each.

Contribution to hypotheses

This step provides a characterisation of the diversity of conditions of implementation of AE practices at the targeted scales of analysis for the project: farm and household scales.

Links to other steps

This step collect the data that will then be analysed under step 5 to build a typology of farms that will then be validated under step 6 and that will guide the sampling of step 8.

Data collection process

Two of the limitations preventing an adequate understanding of rural households' livelihoods are:

1. using a narrow definition of households, which excludes those who are absent at the time of the survey (e.g. migrant members of the household).
2. the classification of every surveyed person by "main activity" for a short specific reference period (the last seven days before the survey).

These criteria cannot capture the diversity of households, increasingly characterized by members engaged in circular migration, nor the strong irregularity and seasonality of agricultural activities, and the many occupations and tasks of every household member. The definitions used here aim to overcome these limitations.

A Household can be defined as a production, distribution and consumption unit based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. These persons can live or not "under the same roof" (for instance, a person living permanently in town and regularly sending/receiving remittances is considered as a household member). A household may be either:

- **a one-person household**, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household
- **a multi-person household**, that is to say, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their incomes and may, to a greater or lesser extent, have a common budget; they may be related or unrelated persons or constitute a combination of persons both related and unrelated (UN 1998).

Depending on the rural area, a multi-person household corresponds to a **"nuclear" family** or it refers to an **"extended" family**. In that latter case, several "nuclear" households reside, produce and consume under the authority of an elder (it can be a father/mother or an elder brother for instance). Most of the time, all members of the "extended" family contribute to work on common plots/manage common herd and the production of these plots contribute to feed the family and to raise incomes (by selling farming and livestock products). Nevertheless, each household members can also have its own farm plots/animals/or other income-generating activity for providing its own needs. In case of surveying, this kind of household, **family as well as individual farming/livestock activities has to be taken into account.**

An agricultural household can be defined as a household in which at least one member spends some time working in agricultural production. We use agricultural household instead of farm household in order to include multi-activity because the household cannot be reduced to the farm due to other activities developed off-farm and in other sectors (non-farm). In addition, using agricultural household

allows including landless agricultural units (i.e rural dwellers without a secured access to land, may it be direct or indirect).

Respondent selection

Respondent selection within the household is a major issue. Together with long recall periods (e.g. one year) and the wording of questions, only focusing on the "household head" (a common choice) can lead to wrong reporting for farming and livestock activities as well as for both wage and self-employment activities (Desiere et Costa, 2019 ; Kilic *et al.*, 2020). It has impacts on the accuracy and reliability of collected information and results in difficulties for comparisons between countries. Moreover, it is well acknowledged that women contribute a lot in agricultural labour and decision-making so they also have precious information.

The main respondent has to be a person in the household who know about farming practices in the household farm. Therefore it may not be the "head of household" or "farm head" as this concept does not reflect decision-making or knowledge of farming practices in many parts of Africa. In the questionnaire, the selected person is named "Main respondent".

The husband and his wife can attend the interview and complete each other answers to question

Other household members or wage workers could participate in the interview, it has to be mentioned if it is the case (cf. module B.)

Contact and permission

When contacting and requesting collaboration be sure to:

- Explain that the information will contribute to a continent wide research project that aims to influence policy.
- Explain that all information collected is anonymous and answers given will not be attributed to individuals.
- Explain that answers given will have no consequences for the respondent.
- Describe how reports based on the information will be made available.
- Read the Informed Consent statement (Appendix 1)
- and obtain verbal or written agreement.

Conducting interviews

The data collection is a structured interview with a detailed questionaire and hence should be conducted by a researcher familiar with the method and able to work in the language of the respondent when possible. The interviewer should understand and use good practice for this type of activity including such things as:

- Making and keeping appointments for the data collection
- Selecting a comfortable and private place for the interview

- Introducing themselves and the project
- Explaining the purpose and conditions of the data collection
- Obtaining consent

Questionnaire

A framework of questionnaire is proposed by the Method group (see appendix 4), with closed questions and will it be adapted to each case study. The questionnaire is structured as follow:

- A **core module** that is used by all the case studies and contains information that will be collected for all contexts. It concerns the following modules:
    - General information about the farm
    - Workforce (family and temporary/permanent/seasonal wage) and activities
    - Land
    - Agricultural assets
    - Income & financial means (access to credit especially)
    - Food security
    - Agroecological practices (adapted to the context)

- **A number of modules that are adapted** and correspond to specific areas that are relevant to some but not all the contexts. It concerns the following modules:
    - Cropping systems and practices
    - Livestock systems and practices

Data tool collection: after having been adapted to each case study context, the questionnaire will be translated on tabs through ODK software. This translation will be ensured by Stat4sd.

Survey duration: between one and two hours depending on farm size and complexity.

Period of reference: What matters is to get a full picture of cropping and livestock systems (including AE practices) based on the accurate enumeration of the complete set of economic activities in which households engage over an extended period of time. **Therefore a 12-months period should be considered.**

Sampling scheme and size

The aim of sampling is to measure a representative sample of the diversity of farms and farmers in the study area. For the usual reasons, use a random sample stratified by relevant factors. The factors used for stratification should be any that are expected to be associated with level of use of agroecological practices and their performance. This might include participation in the project on which the case study is based.

A sample size of about 120 farms per site is needed.

If you need advice or help on design of a suitable sampling scheme for you case study then contact the Methods Group.

Process for piloting, translating, localising and training

The table below presents the distribution of roles between Method group and Case study teams for implementing Step 4

What?	Who and how?
Step 4	
Elaboration of a framework of questionnaire	MG
	CS with MG.
Adaptation of the questionnaire to CS context	From the framework of questionnaire, CS proposed an adaptation of the questionnaire to its specific context and discuss it with MG for ensuring coherence between case studies in terms of data collection. It can be done through (at least) one meeting between MG (some members of MG?) and CS teams.
Translation of the questionnaire on tabs through ODK	Once the questionnaire is adapted to CS context, it is sent to Stat4SD for translation on ODK
	CS and Stat4SD
Questionnaire testing	Once the questionnaire is on tabs, Stat4SD send it to CS and CS test it with few farmers (4-5) for identifying bugs or problem in questions formulation/order, etc.
Sampling process	CS: Design of sampling scheme and identification of selected sample
	MG : can help in the implementation of sampling if needed
	CS
Enumerators training	MG: can provide a framework of general content for the training (objectives of the project and of the data collection). MG can help in the preparation of the training if needed.
Data collection	CS
Database construction and use	A data platform for capture and managing data will be provided by Stats4sd and CS teams trained in its use.
	CS teams will upload their data to the platform
Data cleaning	CS responsible for cleaning and error checking in their data.

Data processing, analysis and reporting methods

Collected data through the questionnaire will be centralized in a specific database managed by Stat4SD.

Each CS will have access to its own data and will be able to proceed to data cleaning and then data analysis.

The detailed process for data analysis is described in the subsequent step.

Step 5: Analysis of Step 4

Specific objectives

In Step 5 the aims are to:

- Build a typology of farm in order to characterize (within each CS) :
    - Initial quantitative description of farms and AE practices
    - The **variability between farms** (=similarities and differences between farms) according to specific variables (for example: land size, type of labour force (ratio family/wage), numbers of crops, intercropping practices, presence of livestock, etc.), AE practices.
    - The **association / correlation between specific variables** (or association between modalities in case of qualitative variables)

Contribution to hypotheses

This step provides a characterisation of the diversity of conditions of implementation of AE practices at the targeted scales of analysis for the project: farm and household scales

Links to other steps

This step analyses the data collected under step 4. It will provide a typology of farm that will then be validated under step 6 and that will guide the sampling of step 8.

Process for piloting, translating, localising and training

The table below presents the distribution of roles between Method group and Case study teams for implementing Step 5

What?	Who and how?
Database construction	A data platform for capture and managing data will be provided by Stats4sd and CS teams trained in its use. CS teams will upload their data to the platform
Data cleaning	CS responsible for cleaning and error checking in their data.
Data analysis at each site	CS MG may help in data analysis if needed.

Data processing, analysis and reporting methods

For the purpose of the project, we propose to implement a multivariate analysis such as principal component analysis (PCA), multiple correspondence analysis (MCA) and cluster analysis with specific variables (variables related to farm characteristics as well as (AE or not) farming practices):

- PCA/MCA are dimensionality-reduction methods that are often used to reduce the dimensionality of large data sets, by transforming a large set of variables into a smaller one that still contains most of the information in the large set. It produces a projection of farms on axes containing the most of the information. PCA/MCA will help to analyse the proximity between variables.
- From farms projected on PCA/MCA axes, cluster analysis will group a set of farms in such a way that objects in the same group (called a cluster) are more similar (in some sense) to each other than to those in other groups (clusters).
- From farms projected on PCA/MCA axes, the clustering analysis will build types, and will identify the major variables characterizing each type

Step 6: Participatory group-level data collection

Specific objectives

In Step 6 the aims are to:

Interpret and explain WITH farmers the relations between practices and structural variables identified through the quantitative analysis. It will consist in discussing linkages between farm characteristics, integration of AE practices and in the farm typologies consistency). The discussions will also address preliminary indicators of a farm's socio-economic performances including income and workload. These focus groups will play an important role in interpreting results of the quantitative data analysis, in particular, heterogeneity between farms according to specific variables, and associations between key variables of interest. These discussions will help to **explain the association between the characteristics of farms and their AE practices**. The focus groups will thus serve for:

a. Participatory validation: According to farmers, do the association of variables and farm typologies capture significant factors that influence whether a farm a) uses agroecology and b) benefits from it? Are there other relations between farms structures, workforce, farming practices and agroecology (not identified through the quantitative analysis)? Are there other typologies, local ideal types that could be interesting to understand the place of agroecology or the lock-ins ?
b. Triangulating or explaining results from key informants.

Contribution to hypotheses

This step should stimulate discussion about how the defining characteristics of farm typologies would a) influence use of agroecological practices (drivers & lock-ins) and b) mediate the outcomes of agroecology;

Links to other steps

This step validate the typology of farms built under step 5 and that will guide the sampling of step 7.

Data collection process

Contact and permission

When contacting and requesting collaboration to focus groups be sure to:

- Explain that the information will contribute to a continent wide research project that aims to influence policy.
- All information collected is anonymous and answers given will not be attributed to individuals.
- Answers given will have no consequences for the respondent
- Reports based on the information will be made available

Conducting focus group

Read the Informed Consent statement and obtain verbal or written agreement (Appendix 2).

- Please have at least 2 people lead the FGDs – one person who facilitates them, and another person who takes notes.
- There should be, at a minimum, 2 focus groups, all women and all men, and possibly also divided by age-group (e.g. younger women and older women).
- Consider having snacks available, including ones that young children can eat (e.g. bananas) so that people, including young mothers, can sit comfortably and discuss at ease.
- Ideally the FGDs are also recorded so that the notetaker can cross-check the notes as it is often difficult to take detailed notes in this context.
- In order to carry out the focus groups, you will need to first compile some key results from the survey to present, as well as a synthesis of the typologies. We suggest:
- using graphs (recommend just univariate or bivariate bar graphs);
- consider diagrams for the different typologies;
- have cards or diagrams for the list of agroecological practices;
- have a list of questions arising from the survey where further clarification is needed.

Guide of discussion

Focus groups will be guided by discussion questions (Appendix 5). A reporting sheet will be provided to ensure that the content of the discussion is recorded as usable data.

Focus group duration: between one and two hours.

Sampling scheme and size

Composition of focus groups

The focus groups will be composed of 6-10 farmers and will be single-sex groups - one with women, one with men. (There may also be 'younger women/men and older women/men groups to elucidate youth perspectives). They will be asked to comment on the findings from the questionnaire, including the different typologies identified.

Process for piloting, translating, localising and training

What ?	Who ?
Elaboration of a framework guide for discussion	MG
Adaptation of the questionnaire to CS context	CS with MG.
Focus groups implementation	CS

Data processing, analysis and reporting methods

The data is recorded as 'structured open text' (see Appendix 6) to allow efficient comparison and synthesis across the key informants in one case study, and for analysis across case studies later.

Analysis will be done within each CS team to produce a qualitative summary that describes both common themes and differences for each question. In addition, findings that suggest *new hypotheses* or that *revise the typologies* will be noted in the qualitative report.

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Appendix 1. Informed consent request for individual interviews

Draft version for discussion 2020 02 03

To be included in each individual interview. The digital form will only allow other questions if the consent is provided. Any refusal to participate must be registered and uploaded to the database.

Thank you for coming. My name is _____, and I work for _____. I am with a team of researchers from (mention the institutions). We are conducting a study to understand

XX Describe the objectives of the survey

in a language and form that is understandable by the respondent XX

You have been selected because

XX Explain how the respondent was selected as part of the study

in a language and form that is understandable by the respondent XX

The information you give us will be completely confidential and nobody other than our team will be able to find out what answers you give to our questions.

We will present the summaries of answers provided by the respondents of this study in a number of reports, but those reports will not mention any names or information that allow anyone to know what answers you give.

The data collected may be of interest to other researchers and we will share it with them. We guarantee to you that it will be impossible for anyone to know what answers came from you and your anonymity will be always maintained.

You don't have to participate if you don't want to, and please interrupt me if you ever want to stop the conversion. The discussion will take about XXXX minutes. Your views will be treated with utmost confidentiality.

Do you have any questions before we proceed?

Do you agree to participate in this study? 1. Yes 2. No

Appendix 2. Informed consent for focus group discussion

Draft version for discussion 2020 02 03

Introduction and purpose: Good morning/afternoon. We are *(names of facilitators)* and we conduct this research on behalf of XXX and the YYY.

The objective of the research is:

X edit X.

Voluntary Participation: Today, we are requesting for your participation in a discussion. Your participation in the study is not remunerated. Your participation is entirely voluntary and you may choose to stop participating at any time and/or not answer some or any of the questions. Your decision not to participate will not influence the treatment you may be receiving or the nature of any ongoing relationship you may have with the researchers or study staff, or the nature of your relationship with XXX and the YYY either now, or in the future. We will not ask everyone's name; we will only record the number of participants in terms of men/ women and age groups. After discussing the consent process, we will ask 1 person from this group to provide her/his name and mobile number (in case of need to follow-up) and sign on behalf of the group.

Risks and Discomforts: We do not foresee any risks or discomfort from your participation in the research.

Procedures, Privacy and Confidentiality: The discussion will last approximately #### hours. During the discussion you will be asked about your experiences and opinions related to X edit X in your area. Throughout the discussion we will be taking notes and we will audio record the discussions. This will ensure we are able to obtain an accurate record of our discussions. If you agree to participate, we will take steps to protect your privacy by keeping the notes of this interview and this consent form in a secure place. We will ensure that no one beside the research team can see or obtain the information you have given us, during data analysis and publication/presentation of results.

After explaining the project and what we will do today, we will ask each of you to indicate if you prefer not to participate. If you prefer not to participate, we will ask you to leave the meeting. Among all those who choose to participate, we will ask one voluntary person to give us his/her name and tel. number. We will not share this information with anyone outside the project.

Do you have any questions at this stage?

More Information about the Research: If you have questions about the research in general or about your role in the study, please feel free to contact the principal investigator via the contact person given to you along with this form.

Group contact person Statement:

The group was read this consent form and we had the opportunity to ask questions; all our questions have been answered to our satisfaction. We freely and voluntarily agree to be part of this research study. We understand that any of us may withdraw from the study at any time. On behalf of the group, I have received a copy of this consent form.

On behalf of the group:

Contact person name and telephone number if available:

_____

Signature: _____Date_____

Researcher's Statement:

I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I believe that the participants understand my explanation and has freely given informed consent.

Signature: _____ Date: _____

Appendix 3. Data collection forms for step 2 per site (in case of various sites in a same case study)

Key informant and interview details

Information needed to track data, not used in analysis

Interviewer name

Interview date

Interview location

Key informant name

Information needed to contextualise responses, could be used in analysis

Key informant gender

Role of key informant in
agriculture in the area

Role of key informant in
the case study project

Context

An overall description of the study context so that each CS can be characterised in the same terms. It includes a description of the role or prominence of 'agroecology' in relevant dialogues.

Guiding questions

1. *Can you tell me about agriculture in this area?*
   Prompts:
   - *What are the main types of agriculture?*
   - *How has agriculture changed in the last 2 decades?*
   - *Have any policies or programs influenced agricultural trends?*
   - *What are some of the main challenges of agriculture?*

Topic	Responses
Main agricultural systems	
Trends in agriculture	
Policies influencing trends	

Agroecology

Position KI in terms of knowledge of a views on agroecology

Guiding question

2. *Now I would like to ask you specifically about agroecology, also called farming with nature or… [fill in appropriate local term].*
   - *Are you familiar with this kind of farming?*
   - *If so, how would you describe it or define it?*
   - *Is it a common way to practice agriculture in this area?*
   - *If yes, are there certain groups or regions where agroecology is more common?*
   - *Are there certain groups or organizations which promote it? If yes, can you tell me more about them?*
   - *Are there certain groups or organizations which are against it? If yes, can you tell me more about them?*

Topic	Responses
Understanding and familiarity with agroecology	
Role of agroecology in farms in the study site in general	
Influencers of agroecology	

Interventions

Description of recent interventions that are the basis of the CS together with their extent, along with other interventions that have had an influence on farms.

Guiding question

3. *I would now like to ask about the project/program [name of project that is the basis of the case study] which has worked in this area.*

Can you describe the project? What was involved?

Prompts: (if the above answer doesn't provide details)

- *What was their interaction with farmers?*
- *Did they provide any inputs to farmers? If so, can you tell me more?*
- *How long has it/did it go on for?*
- *Roughly what proportion of farmers were directly involved? Where others indirectly affected?*
- *Were certain groups of farmers (e.g. better off, particular ethnic groups, male vs female) more likely to participate? If so, can you tell me more about why that was the case?*

4. *Have there been other interventions/projects/programs in the last 5 years that have had an important impact on farming in the location?*

- *If yes – what was involved?*
- *What was their interaction with farmers?*
- *Did they provide any inputs to farmers? If so, can you tell me more?*
- *How long has it/did it go on for?*
- *Roughly what proportion of farmers were directly involved? Where others indirectly affected?*
- *Were certain groups of farmers (e.g. better off, particular ethnic groups, male vs female) more likely to participate? If so, can you tell me more about why that was the case*?

Source	Type of interventions (*)	Time frame (from….to)	%farms directly involved	%farms indirectly affected	Nature of interaction with farmers
This CS	Farmer engagement in research				
This CS	Training				
This CS	Information				
This CS	Input supply				
This CS	Subsidies				
This CS	Establishment of local institutions				
This CS	Support to existing institutions				
Others	…				
Others					
Others					

(* These are examples of types of interventions. It is not an exhaustive list – add others as needed)

Agroecological practices

The AE practices known by key informant to be part of the farms in the study area, whether or not promoted by the intervention.

Guiding question

5. *Can you describe the main agroecological practices found in the farms here. These may be practices that have been used for a long time (conventional or traditional practices), practices introduced by the [name of the CS project] project or though other project and interventions.* Prompt: Examples are in the list of agroecological practices are in this list… [List based on information from where?]

Guiding question

6.
   - *Can you describe how common these practices are – do many people use them? And how important are they for farmers that use them. By 'important' we mean they are influence farmers lives, not just being tried in very small areas.*
   - *Have these practices been used a long time or have they been introduced recently?*

	Estimate proportion of farms using the practice			
Practice	Prior or long term use	In response to this CS	In response to other interventions	How important is the practice?
1				
2				
3				

7. *How is the practice used on the farm?*
   - *Is it replacing something else, combined with something that was there, or used in addition?*
   - *What materials or inputs are used?*

Practice	How is the practice used?	What has it replaced
1		
2		
3		

Who and why is using the practices

Investigation of the variation between farmers in use of the practices and the characteristics of

Guiding question

7. *We know farmers are not all the same and only some will use a particular practice. For the practices we have been discussing, can you describe the characteristics of the people who use it, and why they use it? Can you also describe who does not use it and why not?*

	Users		Non-users	
Practice	Who	Why	Who	Why not
1				
2				
3				

Effects, benefits or implications of using the practices

The implications or impacts, positive or negative, of using the practices, both on the farms/individuals livelihoods and on the landscape or community.

Guiding question

8. *Thinking of each practice in turn, what, in general terms, are the effects on a farm or farmer of using it, compared with alternative practices? Are there also effects of the larger landscape or community?*

	Impacts on users		
Practice	Social	Economic	Environmental
1			
2			
3			

	Impacts on landscape/community		
Practice	Social	Economic	Environmental
1			
2			
3			

9. Please described the labour involved in using each practice compared with the labour requirements of the alternatives.
   - *Does it reduce or increase labour?*
   - *Is the labour worth while for the effect produced?*
   - *Whose labour is affected?*

- *Is there this practice has different labour requirements than the alternative, what else does that affect?*

Practice	Labour required	Returns to labour	Whose labour is affected	Other consequences of labour used in this practice
1				
2				
3				

Anything else

An opportunity to pass on other information the key informant thinks is relevant

Guiding question

10. *Is there anything else we should know about agroecology in the area?*

Wrap-up and finish

Ask if KI has any questions.

Thank and finish in a suitable way.

Appendix 4: Example of questionnaire for Step 4: Characterization of farms and agroecological practices

Pierre Girard (CIRAD), Benoît Dedieu (INRAE), Sidney Madsen (Cornell University), Rachel Bezner Kerr (Cornell University), Sara Mercandalli (CIRAD)

PRECAUTION:

- This first proposal of questionnaire is not adapted to a specific geographical area. The aim is to give an overview of modules and information to collect with Step 4.
- The indicator Minumum Dietary Diversity for Women (MDD-W) can be adapted for the local foods and context – see here for more details about using this indicator and adapt the food list to local foods using this source, http://www.fao.org/3/i5486e/i5486e.pdf Appendix 2
- In the adopted version of the questionnaire, questions will be numbered and coded.
- See glossary for some detailed definition.
- Period of reference: the past 12 months. It can include one or several cropping seasons.
- Data collection tool: tabs with ODK software (the translation from “paper” to “tab” will be done by Stats4SD)

MODULE A. QUESTIONNAIRE ID

***Aim of the module**: metadata*

Questionnaire Number	|__|__|__|
Enumerator Name/Code		|__|__|
Farm location (homestead) GPS coordinates	LATITUDE, N	|__|__||__|__||__|__|
	LONGITUDE, E	|__|__||__|__||__|__|
Commune, district / Code		|__|__|
Village Name / Code:		|__|__|
Date of interview (day/month/year)	|__|__||__|__||__|__|	
Time beginning (HH::MM)	|__|__||__|__|	
Time end (HH::MM)	|__|__||__|__|	
What type of household is it? Tick the box	Single headed |__| Monogamous household |__| Polygamous household |__|	
Phone number The respondent is free to give his phone number but it can help if information is missing (or need to clarified) or for making a new appointment (for further interview in following steps)		

MODULE B. General informations about the farm

***Aim of the module**: Having general information about the farm and knowing if the farm participated in an agricultural project.*

	Main respondent	
Name	SURNAME _____ FIRST NAME _____	
Date of birth	|__|__|__|__|	
Gender 1=Male ; 2=Female	|__|__|	
Tribe List to adapt to CS	_____ |__|__|	
Matrimonial situation Tick the box	Married |__| Divorced/separated |__| Widowed|__| Single |__| Other : _____	
If a wife, what is her position (in case of polygamous household)? 1=First Spouse; 2=Second spouse, etc.	|__|	
Level of education Tick the box	Never attended |__| Current|__| Achieved|__|	If current or achieved : Primary |__| Secondary |__| Tertiary |__|
Did the household participate in an agricultural project during the last 5 years? 0=No ; 1=Yes	|__|__| (If yes, fill in the table below)	

Name of the project	Organisation implementing the project (NGO, State)	Year	Type of support (*1) Several possible choices	Observations

(*1) Support : 1.Seeds, 2.Plant, 3.Fertilisers. 4.Pesticides, 5.Animal medicines, 6. Animals (to specify) 7.Agricultural equipment (to specify) 8.Training, 9.Advisory, 10.Financial support, 11.Food 12.School supplies, 13.Medicine or other health support 99.Other (to specify)

MODULE C. workforce, activities and social capital

Aim of the module: *Knowing the household and non-household farm workforce and other activities in which the household members are engaged (i.e. to know whether or not the household is engaged in economic diversification and what type of diversification)*

ROSTER OF HOUSEHOLD MEMBERS (those who live in the household on a permanent basis or seasonal/temporary basis)

N°	Name	Relation to the main respondent (*1)	Gender (*2)	Age	Level of education (precise: Current/achieved (*3)	Number of absent month during the last 12 months	If the hh member is absent during at least 3 months, does he/she help the household? (*4) * Except sendings for festivities	If the hh member is absent during at least 3 month, does the household transfers money to him/her?* 0=No 1=Yes * Except sendings for festivities	Frequency of participation in family farming and livestock activities (including processing and marketing) (*5)	Does he/She cultivate his/her own plot (in addition to collective field)? 0=No ; 1=Yes	Main other activities (*6)	Second activity (*6)	Did he/she do piecework for others farmers during the last year 0=No, 1=yes Piecework=daily/temporary agricultural wage work (it does not include mutual help)
1													
2													

(*1) 1=Spouse ; 2=Children ; 3=Grand children ; 4=Other relative ; 5=Domestic helper ; 6=Parent/grand-parent ; 7= other, specify
(*2) 1=male ; 2=female

(*3) 1=No school ; 2= Primary ; 3=Secondary ; 4=Tertiary

(*4) 0=No ; Help with … (several possible choices) 1=money ; 2=Food ; 3=Clothes ; 4=School supplies ; 5=Medicines ; 6=Animals ; 7=Agricultural inputs or equipment ; 8=Construction materials or house equipment; 8=Others
(*5) (question to be ask even for children!!) 0=Do not contribute ; 1=Every day (full-time basis) ; 2= At least three days a week (6 months/year or hh member engaged in two activities, farming and trading all the year=part-time basis) ; 3= three months/per year or 1 week/month or during holidays and week-end for children attending school (a quart-time basis)
(*6) Aside from farming. List of activities to be adapted to local context. Be careful of including domestic activities!!

COLLECTIVE ACTION OF HOUSEHOLD MEMBERS

Is anyone in this household a member of a farmer cooperative, farmer group, farmer association? 0=No ; 1=Yes	|__|__|
If yes, fill in the table below	_____

N°	Organisation name	Who is member? (*1)	Type organisation (*2)	Role of the family member within the OP (*3)	What type of services the farmer uses from the organisation? (*4)	Observations
1				_____ |__|__|		
2				_____ |__|__|		
3				_____ |__|__|		
4				_____ |__|__|		

(*1) 1 = Main respondent 2 = Spouse, 3 = Son/daughter or 4=Other member of the family
(*2) 1=Cooperative 2=Farmer association 3=Women association 5=Savings/Credit association ; 8=Religious organisation ; 9=Socio-cultural association 99=Other organisation, specify
(*3) 1=Simple member, 2=Responsibility (chairman/woman, secretary, treasurer, other), 3=Technician, trainers, farmer-trainer, 4=Other (specify)
(*4) List to be adapt to each case study

KNOWLEDGE NETWORK: What are the main ways that you learn new information or solve a problem in your farming?

		Rank
Rank the top **two** sources in order of importance for information that you have used in your own farm.	Self- experience / observation	
	Ask relatives/friends	
	Ask other farmers (not relatives or friends)	
	Ask a farmers group – list	
	Radio	
	Television	
	Extension agents (agricultural field assistants)	
	Special activities – list (e.g. field day) _____	
	Demonstration trials	
	Newspaper	
	Shopkeeper	
	Other (specify)	

NON-HOUSEHOLD MEMBERS WORKFORCE

MUTUAL LABOUR HELP (See glossary for definition)	
Did you contribute to mutual farming labour help for with other farms during the last year? 0=No ; 1=Yes	|__|__|
If yes, specify the farming activities	_____
Did you benefit from mutual farming labour help from other farms during the last year? 0=No ; 1=Yes	|__|__|
If yes, specify the farming activities	_____

External PERMANENT or SEASONAL workforce (=workforce hired on a year or monthly or cropping season basis) See glossary for definition	
Did you hire **permanent or seasonal workers** during the last year 0=No ; 1=Yes	|__|__|
If yes, fill in the table below	_____

Num	Type of workforce (*1)	Gender (*2)	Main activities (*3)	Duration over the last year (months)
1			I___I	
2			I___I	
3			I___I	
4			**I___I**	

(*1) 1=Seasonal (few months), 2=Permanent (all the year)

(*2) 1=male ; 2=female

(*3) 1=Crops, 2=Livestock (animal keeping/care/feeding as well as collecting fodder), 3=Domestic chores (servant), 4=Non-agricultural activities 5=Food processing, 6=Other, specify

CASUAL external workforce (=workforce hired on a daily/weekly basis or piecework basis). See glossary for definition	
How many days did you hire **casual workers** during the last year? 1=Never ; 2=Between 1 and 3 days ; 3=Between 3 and 10 days ; 5=Above 10 days	|__|__|
If yes, for what type of activities?	_____

List of agricultural and livestock activities adjusting to context	

MODULE D. Land

***Aim of the module**: Knowing the cultivated and non-cultivated land area of the farm and assess its land security. And also about access to grazing land (pastures) for animals*

Agricultural land (cultivated and non-cultivated during the last year). See glossary for definition						
N° Field	What is the land tenure status? (*1)	What is the area?	Area unit 1=Hectare 2=Are 3=Local metrics	How did you acquire this field? (*2)	Status of the field during the last year (*3)	How confident to you feel that you will always have access to this land? (* 4)
01						
02						
03						
04						
05						
06						
07						

(*1) 1=Own property (=titled land, customary title or state title), 2=Kin, 3=Rented 4=Sharecropping, 5=Borrowed 6=Other, specify
(*2) 1= From your family before inheritance 2=inheritance 3=From spouse family 4=Purchased 5=Allocated/given 6=Just walked 7=Other, specify
(*3) 1=cultivated, 2=fallow
(*4) 1=Very, 2=somewhat, 3=Not at all

Grazing and rangeland areas See glossary for definition		
N° area	What is the land tenure status? (*1)	How confident to you feel that you will always have access to this grazing area? (* 2)

(*1) 1=Own property (=titled land, customary title or state title), 2=Kin, 3=Rented 4=Sharecropping, 5=Borrowed 6=Common rangelands 7=Other, specially)
(*2) 1=very, 2=somewhat, 3=Not at all

MODULE E. Agricultural assets

***Aim of the module**: Knowing the farm assets*

Do you have farming and livestock equipment on your own? 0=No ; 1=Yes	|__|__|
If yes, fill in the table	

N°	Equipment (*1)	Year of acquisition	Is it in working conditions? 0=No, 1=Yes
01		|__|__|__|__|	|__|
02		|__|__|__|__|	|__|
03		|__|__|__|__|	|__|

(*1) The list of equipment to be adjusted to local context. It includes equipment for soil cultivation, chemicals spreading (pesticides), harvesting, transporting, processing. It must include manual/motorized/animal draught equipments. Very common equipment (e.g. do not need to be included in the list).

Did you sell, give or lose some agricultural equipment during the past 5 years? 0=No ; 1=Yes	|__|__|
If yes, fill in the table	

	Equipment (*1)	Type of operation (*2)	Specify the reason for selling, giving or losing
01			
02			
03			

(*1) The list of equipment to be adjusted to local context. It includes equipment for soil cultivation, chemicals spreading (pesticides), harvesting, transporting, processing. It must include manual/motorized/animal draught equipments.
(*2) 1=Selling, 2=Gift, 3=Lose, 4=Other, specif

MODULE F. Cropping systems

Aim of the module: *To describe cropping systems*

ROSTER OF CULTIVATED CROPS DURING THE LAST YEAR (PROVIDE A TABLE FOR EACH CROPPING SEASON IF SEVERAL CROPPING SEASONS)

Type of crop (*1) [please probe for all crops, including minor ones]	Who usually decide to plant this crop? (*7)	Area cultivated	Area unit 1=Hectare 2=Are 3=local metrics	Did you irrigate your crop? 1=Yes 2=No	Intercropping 0=No, 1=Yes With what other crops (*1)	Crop rotation? 0=No, 1=Yes With what other crops before/after (*1)	Did you use chemical fertilizers? (*4)	Did you use chemical herbicides? (*4)	Did you use chemical pesticides? (*4)	Did you use manure or compost or other types or organic residue? (*4)	Quantity harvested	Who usually decides to sell this crop? (*7)	Crop marketing (*5)	Did you plan to sell these crops or was it forced by an illness or other crisis?	How would you rate your access to market to sell your crops? (*6)

(*1) List of crops adapted to context
(*2) 1=own production 2=local variety (purchased) 3=non–hybrid certified variety (purchased) 4=hybrid certified variety
(*3) 1=Full manual, 2=Partly manual, 3=Full draught animal, 4=Partly draught animal, 5=Full motorized, 6=partly motorized, 7=No ploughing
(*4) 1=Full, 2=Partly, 3=No use
(*5) 0=No sell, 1=Direct sell on local market, 2=Sell to trader for local market, 3=Sell to trader for national market, 4=Sell to trader for international market; 5=Contract farming, 6= Local marketing channels through project or program promoting agroecology ; 7= Other, specify
(*6) 1=Very easy (close by) ; 2=Easy to reach ; 3=Somewhat difficult ; 4=Difficult ; 5=Very difficult
(*7) 1= Husband 2 = Wife 3 = Both together 4=Parents or parents in law 5=Son/Daughter 6=Brother/sister

HOME GARDEN

Do you have a home garden? 0=No; 1=Yes	|__|__|
Who is responsible for the home garden? 1= Husband 2 = Wife 3 = Both together 4=Parents or parents in law 5=Son/Daughter 6=Brother/sister	
If yes, what did you cultivate in your home garden last year? (fill in the table)	

Type of crops (*1)	Area	Area unit 1=Hectare 2=Are 3=local metrics	Did you use chemical or synthetic fertilizers? (*4)	Did you use chemical herbicides? (*4)	Did you use manure or compost? (*4)	Quantity harvested	Crop marketing (*5)	How would you rate your access to market to sell your gardening products? -*6)

(*1) List of crops adapted to context
(*2) 1=own production 2=local variety (purchased) 3=non–hybrid certified variety (purchased) 4=hybrid certified variety
(*4) 1=Full, 2=Partly, 3=No use
(*5) 0=No sell, 1=Direct sell on local market, 2=Sell to trader for local market, 3=Sell to trader for national market, 4=Sell to trader for international market; 5=Contract farming, 6= Local marketing channels through project or program promoting agroecology ; 7= Other, specify
(*6) 1=Very easy (close by) ; 2=Easy to reach ; 3=Somewhat difficult ; 4=Difficult ; 5=Very difficult

TREES ON FARM

Do you have trees **on your cultivated plots**? (e.g. leguminous trees) 0=No; 1=Yes	|__|__|
If yes, fill in the table:	

Type of tree List of trees to be adapted to local context	Type of cultivated crops under trees List of crops adapted to context	Assessment of number of trees on one acre/hectare

Do you have **tree hedges?** 0=No; 1=Yes	|__|__|
If yes, what are the types of tree in your hedges? List of trees to be adapted to local context	
If yes, what is the total length of tree hedges on your farm?	

Do you have **an orchard** (without cultivated crops under e.g. mango orchard)? 0=No; 1=Yes	|__|__|
Who is responsible for the orchard? 1= Husband 2 = Wife 3 = Both together 4=Parents or parents in law 5=Son/Daughter 6=Brother/sister	
If yes, fill in the table:	

Type of tree List of trees to be adapted to local context	Area covered by trees	Did you use chemical fertilizers? 1=Full, 2=Partly, 3=No use	Did you use chemical fertilizers? 1=Full, 2=Partly, 3=No use	Did you use manure or compost? 1=Full, 2=Partly, 3=No use	Quantity harvested	Crop marketing 0=No sell, 1=Direct sell on local market, 2=Sell to trader for local market, 3=Sell to trader for national market, 4=Sell to trader for international market; 5=Contract farming, 6= Local marketing channels through project or program promoting agroecology ; 7= Other, specify

MODULE G. Agricultural practices

Aim of the module: *To know the type of « classical » agricultural practices and their intensity.*
Some questions about the use fertilisers, pesticides have been asked per crops (module F.) but this module could crosschecked information and the evolution of the practice

OPENED QUESTION

What are your most pressing agricultural concerns? Opened question	

SOIL CULTIVATION

How do you prepare your fields before each seeding? 1=No preparation ; 2=Cultivating (with hoe) ; 3= Ploughing (with draught animal) ; 4=Ploughing (with tractor)	
Proceed from the list of cultivated crops (from previous question)	|__|__|

SEED SYSTEM

What type of crops did you cultivate last year? 1=local/tradition variety ; 2=OPV-improved variety ; 3=hybrid improved variety	
Where did you mainly source your seeds last year? 0=seed saving ; 1=seed exchange with other farmers ; 3=agrodealers ; 4= local vendors.	
For both questions, proceed from the list of cultivated crops (from previous question)	|__|__|

FERTILITY MANAGMENT

Please tell me all the methods you are currently using to deal with your soil fertility (Fill in the table below). Probe each one. When you probe all practices, rank 1-3 most important methods for improving soil fertility (last column)	

Soil fertility method ***The list is only indicative as it is context specific. It should be elaborated by each context***	Did you use this practice on your field last year? 1=Yes 2=No	Since which year have you been using this same method?	How has your use of this practice changed during the past 5 years? 0=No change ; 1=Increase : 2=Decrease	Last year, on how much acreage did you use this practice?	Last year, on what crops do you much acreage this practice? List of crops adapted to context	Rank 1-3 most important methods for improving soil fertility
Synthetic/chemical/Mineral fertilisers						
Fallowing						
Improved fallowing						
Pit planting with manure or mulch						
Intercropping with legumes						
Early incorporation of legume residues into soils						
Crop rotation with legumes						
Animal Manure						
Compost manure						
Mulching						
Planting agroforestry trees						
Planting vetiver grasses						
Box ridges						
Others (specify)						

If you used animal manure or compost manure last year, fill in the table below

	Do you make it by yourself or do you buy it?	How much did you spread on your fields last year? (assessment in terms of chart or tons)
Animal manure		
Compost manure		

If you used fertilisers last year, fill in the table		
Type of fertiliser	Number of kg (or bags – to convert in kg) during the last year	Amount (national currency)
Complex (NPK)		
Urea (N)		
Other types, specify		

If you practice fallow last year, fill in the table	
What is the average duration of fallow? (month or year)	|____|
Are fallow plots protected from soil erosion with cover crops?	|____|
If yes, with what type of cover crops? List of crops adapted to context	|____|

PEST AND DISEASES MANAGEMENT (it includes pre-harvest AND post-harvest operations

Please tell me all the methods you are currently using to deal with pests and diseases (Fill in the table below). Probe each one When you probe all practices, rank 1-3 most important methods for improving soil fertility	

Method for dealing with pests and diseases **PROBE EACH ONE!**	Did you use this practice on your field last year? 1=Yes 2=No	Since which year have you been using this same method?	How has your use this practice changed during the past 5 years? 0=No change ; 1=Increase : 2=Decrease	Last year, how much acreage did you use this practice on?	Last year, on what crops do you much acreage this practice? List of crops adapted to context	Rank 1-3 most important methods for dealing with pests and diseases.
Intercropping						
Botanical spray						
Planting repellant plants						
Crop rotation						
Manual killing						
Pesticides						
Use of disease/pest resistant varieties						
Removal residues						
Ploughing						
Others (Specify)						

If you used pesticides last year, fill in the table (list to adapt to the context) :		

Type of pesticides	When do you spray? 1= Systematic on a calendar basis (spray regardless of the need to do so) 2=When necessary (spray only when pests are above a threshold)	Quantity (unit measure to be adapted)	Amount (national currency)
Total herbicide (e.g. glyphosate)			
Selective herbicide (e.g. atrazine)			
Pesticides			

MODULE H. Livestock systems

ROSTER OF LIVESTOCK (AT THE TIME OF SURVEY)

Animal type	Breeds List to adapt to local context. Several choices possible	How many animals do you have on your farm currently?	What is the main use of these animals Several choices possible 1=Milk ; 2=Agricultural labour ; 3=Manure ; 4=Savings (the herd an "asset bank") 5=Fattening 6=Eggs 7=Other, specify	Who is primarily responsible of these animals? 1= Husband 2 = Wife 3 = Both together 4=Parents or parents in law 5=Son/Daughter 6=Brother/sister	Among these animals, do you keep/care animals from other people? If yes, how many?	Do you have animals placed with other people? If yes, how many?	Have you bought animals last year? If yes, how many?	Change in amount of the number of animals on farm over the past 5 years 1=Increase, 2=Decrease, 3=No change
Cattle								
Sheep								
Goats								
Donkeys								
Horses								
Pigs								
Poultry (chicken garden)								
Others : _____								

LIVESTOCK BUYING

Have you bought animals last year? 0=No, 1=Yes		
	If yes how many animals?	|__|__|
	If yes, who is responsible for buying these animals? 1= Husband 2 = Wife 3 = Both together 4=Parents or parents in law 5=Son/Daughter 6=Brother/sister	

LIVESTOCK MARKETING

Type of animal List of animals from previous table	What products do you sell from your animals? (possible several choices) 1=Milk ; 2=Meat ; 3=Living animals 4=Manure : 5=Wool ; 7=Eggs 8=Other, specify	Who usually decide to sell livestock product? 1= Husband 2 = Wife 3 = Both together 4=Parents or parents in law 5=Son/Daughter 6=Brother/sister	How do you mainly sell your product? 1=Direct sell on local market, 2=Sell to trader for local market, 3=Sell to trader for national market, 4=Sell to trader for international market, 5=Contract farming; 6=Other, specify	How would you rate your access to market to sell your livestock products? 1=Very easy (close by) ; 2=Easy to reach ; 3=Somewhat difficult ; 4=Difficult ; 5=Very difficult

MODULE I. LIVESTOCK PRACTICES

BREED DIVERSITY

What breeds for the sires did you purchase last year? 0=No purchase ; 1=improved breed ; 2=local breed; 3=both improved and local breed	|__|

LIVESTOCK FEEDING (ask these questions for each animal species raised by the farmer, list from previous question)

Did your animals graze last year? 0=No, 1=Yes		|__|
If yes, where did they graze last year? 1=in pasture areas (excluding crop fields), 2=in crop fields (after harvest), 3=both		|__|
	If they grazed in crops fields, how many days/weeks did animals graze crop residues?	|__|
Did other animals graze on your fields last year? 0=No, 1=Yes		
	If yes, during how many days/weeks?	
Did you practice transhumance last year? 0=No, 1=Yes		|__|
	If yes, how many animals made transhumance last year? (list of animals from previous question)	|__|
	If yes, how many months did your animals were in transhumance last year (list of animals from previous question)	|__|
Aside from grazing, what type of food did you give to your animals last year? 0=Nothing 1=Own fodder/grain exclusively, 2= Own fodder/grain exclusively + purchased fodder/grain; 3=Purchased fodder/grain exclusively		|__|

LIVESTOCK HEALTH (ask these questions for each animal species breeded by the farmer)

Have you vaccinated your animals during the last year? 0=No, 1=Yes		
	If yes, what vaccines? (*2) List of vaccines adapted to the context	
	How has your use of vaccines changed during the past 5 years? 1=Decrease ; 2=Increase ; 3=No change	
Did you use antiparasit (for ecto as well as endo parasit) for your animals during the last year? 0=No, 1=Yes		
	If yes, how has your use of drugs changed during the past 5 years? 1=Decrease ; 2=Increase ; 3=No change	
	If no, what are the ways that you manage parasit? [list]	
Did you use antibiotics for your animals during the last year? 0=No, 1=Yes		
	If yes, how has your use of drugs changed during the past 5 years? 1=Decrease ; 2=Increase ; 3=No change	
	If no, what are the ways that you manage livestock health? [list of local practices	

BIOSECURITY MEASURES

If some of your animals are sick, do you put them in quarantine? 0=No, 1=Yes	
If you buy news animals, do you put them in quarantine? 0=No, 1=Yes	

MODULE J. AGROECOLOGICAL PRACTICES

Aim of this module: *this module focuses about the implementation of AE practices (promoted by a project or not)*

About AE practices **ALREADY IMPLEMENTED BY THE FARM** (from the previous answers, the questionnaire will focus on AE practices implemented by the farm

"You told me that you use the XXX practice,…"

How did you learn about this practice? 1=Training 2=Training with public extension services, 3=Informal exchange with neighbours, 4=Radio, other media, 5=Religious organisation		
What practice did you implement before for reaching the objective? 1=Nothing 2=Specify the name of practice		
What are the tradeoffs of using this practice vs. the previous practice? 1=Increasing in yield 2=Protecting environment 3=Better for heath 4=Increasing incomes 5=Cheaper etc. (modalities to build from step 2 and bibliography).		
Does this practice require a specific equipment? 0=No 1=yes		
	If yes, how did you get this equipment? 1=Inheritance or gift from a relative ; 2=Gift from a project (NGO or state) 3=Credit from a project (NGO or state) ; 3=Credit from relatives 4=Credit from the bank 5=Collective informal credit (tontine) 6=Savings from another activity (specify which one) ; 7=Do not own the equipment, he/she borrows it	
Does this practice require more labour than the previous practice? 0=No ; 1=Yes		
	If yes, who mostly provided the "extra-work"? 1=Household members 2=Permanentwage workers 3=Seasonal wage workers 4=Casual wage workers	
	If you hired an external workforce, how did you pay for labour? 1=From your agricultural sellings 2=Credit from relatives 3= Collective informal credit (tontine) 4=Credit from the bank 5=Savings from another activity (specify which one)	

About AE practices **NOT IMPLEMENTED BY THE FARM**

For each local AE practices not implement by the farm

If you do not implement the practice, did you already try it? 0=No, 1=yes		
	If you previously used the practice, why did you stop? 1=Practice non adapated to his farm, 2=Lack of workforce, 3=Lack of cash flow, 4=The farmer considers that he has not enough information on the practice before to try it, 5=The farmer considers it is not a satisfying practice (specify why), 6=Other reason, specify	
If you know of the practice but do not implement it, what is the main reason for not implementing it? 1=Practice non adapted to his farm, 2=Lack of workforce, 3=Lack of cash flow, 4=The farmer considers that he has not enough information on the practice before to try it, 5=The farmer considers it is not a satisfying practice (specify why), 6=Other reason, specify		

MODULE K. Financial means

***Aim of the module**: To assess the financial dependency of the household*

CREDIT

Did you or anyone in your household receive credit during the last year? 0=No 1=yes		
	If No, what are the reasons that you could not get credit?	
	If yes, fill in the table below	

Origin of credit 1=Bank, 2=Microfinance institution, 3=NGO, 4=Farmer organisation, 5=Trader, 6=Religious organisation, 7=Other household, 8=Family, 9=Other, specify	Object 1=Cropping season credit, 2=Investment credit, 3=Consumption credit, 4=Family event, 5=School supplies, 6=Buying animals 7=Other, specify	Real utilization 1=Cropping season credit, 2=Investment credit, 3=Consumption credit, 4=Family event, 5=School supplies, 6=Buying animals 7=Other, specify	Amount of credit	Duration of credit (months)

REMITTANCES

Did you **receive** any remittances from non-household members or other persons? 0=No 1=yes		
	If yes, fill in the table below	

Type of remittances 1=Food ; 2=Clothes ; 3=School supplies ; 4=Medicines ; 5=Animals ; 6=Agricultural inputs or equipements ; 7=Construction materials or house equipment; 8=Others	Is the sender a hh member? 0=No 1=yes	Frequency over the last year 1=One time a year ; 2=Between 1 and 5 time a year ; 3=Between 1 and 3 times a month.	For what do you use it? 1=Buying inputs 2=Buying animals 3=Short-term consumption needs ; 4=Long-term consumption needs, 5=Family event, 6=School supplies, 6=Other, specify

Did you **send** any remittances from non-household members or others persons? 0=No 1=yes		
	If yes, fill in the table below	

Type of remittances 1=Food ; 2=Clothes ; 3=School supplies ; 4=Medicines ; 5=Animals ; 6=Agricultural inputs or equipements ; 7=Construction materials or house equipment; 8=Others	Is the receiver a hh member? 0=No 1=yes	Frequency over the last year 1=One time a year ; 2=Between 1 and 5 time a year ; 3=Between 1 and 3 times a month.

MODULE L. FOOD SECURITY AND POVERTY PROXIES

FOOD SECURITY

HFIAS QUESTIONS

In the past four weeks, did you worry that your household would not have enough food? (*1) and (*2)	
In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? (*1) and (*2)	
In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources? (*1) and (*2)	
In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food? (*1) and (*2)	
In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food? (*1) and (*2)	
In the past four weeks, did you or any household member have to eat fewer meals in a day because there was not enough food? (*1) and (*2)	
In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food? (*1) and (*2)	
In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food? (*1) and (*2)	
In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food? (*1) and (*2)	

(*1) Occurrence 0 = No (skip to the next question) 1 = Yes

(*2) Frequency of occurrence 1 = Rarely (once or twice in the past four weeks) ; 2 = Sometimes (three to ten times in the past four weeks) ; 3 = Often (more than ten times in the past four weeks)

WOMEN'S DIETARY DIVERSITY: (standardized methodology] – please ask **an adult woman** (**aged 15-49 years**) the following question. (adapt the food list to local foods using this source, http://www.fao.org/3/i5486e/i5486e.pdf Appendix 2)

Read to participant: Now I will ask you questions about food stuffs and drinks that you ate or drank yesterday from the time she woke up until she went to bed *(Do not include food or drink taken elsewhere*

Did you eat or drink any of the following yesterday?) 0=No, 1=Yes

Food group	**Examples**	
Food made from grains	Any food such as Nsima, porridge, bread, spaghetti, scones, biscuits, rice, boiled whole maize grain, sweetbeer, boiled samp, milk scone, doughnuts, maize- banana pan cake, or any food made from finger millet, sorghum, bullrush millet, maize and wheat?	__ Yes (1) __ No (0)
White tubers, roots and plaintains	Any food in the group of: white sweet potatoes, coco yams, cassava, potatoes, yams, plantains, manioc, yucca, taro or any white roots, plantain and tubers?	__ Yes (1) __ No (0)

Pulses : Beans, peas, and lentils	Any type of beans and peas e.g beans, cow peas, pigeon peas, nkhungudzu, peas, ground beans, soya beans, green gram, custard apple, Nseula, chick peas? Includes hummus, tofu and tempeh.	__ Yes (1) __ No (0)
Nuts and seeds	Any tree nut, ground nuts, pumpkin seeds, sunflower seeds, cashew, macadamia nuts or other nut/seed 'butters' or pastes.	__ Yes (1) __ No (0)
Milk and milk products	Milk, cheese, yoghurt or other milk products but NOT including butter, ice cream, cream or sour cream.	__ Yes (1) __ No (0)
Organ meat	Liver, kidney, heart or other organ meats or blood-based foods, including from wild game.	__ Yes (1) __ No (0)
Meat and poultry	Any meat e.g beef, lamb, pork, goat meat, rabbit meat, mice, wild game, poultry duck, guinea fowl or any other bird, or any other meat.	__ Yes (1) __ No (0)
Eggs	Eggs of any kind from poultry or any other bird.	__ Yes (1) __ No (0)
Fish)	Fresh or dried fish, shellfish or seafood.	__ Yes (1) __ No (0)
Dark green leafy vegetables	Relish of dark green leafy vegetables as well as the indigenous vegetables and wild/foraged leaves including, cat's whiskers leaves, Amaranthus, cassava leaves, sweet potato leaves, mastard, rape, local rape, pumpkin leaves, cow peas leaves, bean leaves, denje, black jack leaves.	__ Yes (1) __ No (0)
Vitamin A rich tubers & vegetables	Any food such as: pumpkins, carrots or sweet potatoes having yellow orange pigment,	__ Yes (1) __ No (0)
Vitamin A rich fruits	Any fruits like papaya, mangoes that are yellow or orange inside.	__ Yes (1) __ No (0)
Other vegetables	Any kind of relish from leafy vegetables e.g Chinese cabbage, okra, cabbage, egg plants ,tomatoes, onions, green pepper and green beans?	__ Yes (1) __ No (0)
Other fruits	Any other fruits including the indigenous wild fruits e.g oranges, tangerines, lemons, tamarind, elephant fruits, masawo, avocado pears, bananas and baobab fruits?	__ Yes (1) __ No (0)
Other beverages	Any tea or coffee without added sugar, alcohol, clear broth	__ Yes (1) __ No (0)
spices or condiments	Ingredients used in small quantities for flavour such as chilies, spices (black pepper, salt, herbs, fish powder, tomato paste, flavour cubes, hot sauce.	__ Yes (1) __ No (0)

Oils and Fats	Oils, fats or butter added to food or used for cooking including extracted oils from nuts, fruits and seeds and all animal fat.	__ Yes (1) __ No (0)
Sweets	Any sweet, sugar, honey, sugary foods e.g chocolate, sweets, ice cream, sweet pasties, cookies	__ Yes (1) __ No (0)
Sugar sweetened beverages	Sweetened fruit juices, juice drinks, soft drinks/fizzy drinks, chocolate drinks, malt drinks, yoghurt drinks, sweet tea or coffee with sugar.	__ Yes (1) __ No (0)
Savory snacks	Crisps, chips, fried dough or other fried snacks	__ Yes (1) __ No (0)
Optional if eaten/consumed in area :		
Red palm oil		__ Yes (1) __ No (0)
insects	Insects, insect larvae/grubs, insect eggs and land and sea snails	__ Yes (1) __ No (0)

POVERTY PROXIES

If the survey takes place at respondent homestead, observe the conditions of the housing unit and, if necessary, ask questions

Main flooring type: 1=cement 2=earth/mud 3=ceramic tiles 4=wooden 5=other (specify)_____	|__|__|		
Main material used in outer walls: 1=mud/unburnt bricks 2=burned bricks/cement bricks/stone 3=wood 4=iron sheet 5=grass/reed/bamboo/poles 6=other (specify) _____	|__|__|	Type of roof: 1=grass thatched 2=iron sheet 3=roofing tile 4=concrete 5=cardboard 6=asbestos ; 7=other (specify) _____	|__|__|

Possessions and assets, does THE HOUSEHOLD owns…

What possessions and assets, how many does the household own… ? put the number					
Bicycle	|__|__|	Radio	|__|__|	Mobile Phone	|__|__|
Motorbike	|__|__|	TV	|__|__|	Solar panels	
Car	|__|__|	Computer	|__|__|		
	|__|__|	Refrigerator	|__|__|		

How many **close relatives** (those who will readily help you when you need help) live in your community?	
How many **close friends** (those who will readily help you when you need help) live in your community?	

Comment on whether the respondent could be a case for life histories: Is he/she open and frank in conversation? Does he/she appear to be interested in participating in this research?	

Appendix 5: Guide for focus group discussion step 6

Section 1: Participatory validation/discussion of survey analysis results

General survey results

Introduction: General. Look at the analysis of survey results.

1. Are any of these findings consistent with what you know of your community?
    a. Which ones?
2. Are any of these findings contradictory or incorrect based on what you know of your community?
    a. Which ones?
    b. Why do you think the findings are contradictory?
3. Are any of these findings surprising?
    a. Which ones?
    b. Why are they surprising?

Section 2: Additional hypothesis testing

[in italics we have listed some features of socio-economic viability but these can be changed based on the aspects we think are most important]

Describe roughly the categories of more agroecological practices vs. less agroecological practices used in the locale, based on the survey. *This activity should include a display, picture or diagram.*

4. Are there any agricultural practices missing from this description? In which category would you place them (more agroecological vs. less agroecological)?

Based on these listed/categorized practices…

Create a set of cards, with one practice written and depicted on each card. Ask the farmers to sort the cards into piles based on the following questions # 5-8:

5. Which practices would a farmer use if they wanted to earn more money?
    a. Of these practices, which ones are the most important to earn more money?
    b. Can you explain *how* using these practices helps farmers earn more money?
    c. In your experience here, have you seen that farmers who use these practices earn more income? Why/Why not? [we are probing here to ensure that they are not responding with the expected response about a practice]

6. Which practices would a farmer use if they wanted to ensure their household's food security?
    a. Of these practices, which ones are the most important to improve food security?
    b. Can you explain *how* using these practices helps farmers improve food security?
    c. In your experience here, have you seen that farmers who use these practices improve their food security? Why/Why not? [we are probing here to ensure that they are not responding with the expected response about a practice]

7. Which practices would a farmer use to improve their household's well-being?
    a. Of these practices, which ones are the most important for a household's well-being?
    b. Can you explain *how* using these practices helps with household well-being?
    c. In your experience here, have you seen that farmers who use these practices have improved well-being? Why/Why not? [we are probing here to ensure that they are not responding with the expected response about a practice]

8. How important are the agricultural practices you use for your household's *autonomy or financial independence*?
    d. Which ones are the most important for autonomy or financial independence?
    e. Can you explain *how* using these practices helps with autonomy or financial independence?
    f. In your experience here, does everyone who uses similar agricultural practices gain autonomy or financial independence?
9. Which agricultural practices are *very difficult* to implement? Why?

10. Can you divide these agricultural practices into low, moderate and high *amounts of labor* or work?
    a. Can you explain more *how* the practices have higher or lower amounts of labor?
    b. Does the amount of work required influence the practices you choose to use?

[End Pile sort activity here.]

11. Have you noticed that your agricultural practices influence the environment on your farm?
    a. Can you tell me more about that?
    b. Is this important to you or to other people in this community?

    Probe for the following ***(might have pictures to help guide this discussion question)***

    - Soil quality or health, such as:
        - Soil moisture
        - Soil erosion
        - Water logging– too much water in wet seasons
        - Water retention (better / longer storage of water when it is dry)
        - Soil nutrients and/or organic matter (e.g. richer, darker soil, soil nitrogen from legume intercrops or rotations and/or agroforestry trees)
    - Water supply (streams, springs, wells) – quantity and quality (e.g. less fertilizer or
        - pesticides in water supply)
    - Crop and animal production
        - Pest animals (e.g. birds, rodents, parasites that damage, infect, predation, for crops or livestock)
        - Pest plants (weeds, invasive species, poisonous plants, competition with crop resources such as light, nutrients and water)
        - Beneficial animals (regulate crop pests, pollinate crops, honey, meat)
        - Beneficial plants (supports beneficial animals like bees, shade trees for livestock, timber, fuelwood, medicine etc)
    - Tree cover and shade
    - Pasture quality/quantity/duration

- Aesthetics, (e.g. landscapes which are pleasant to look at)
- Disease or exposure to toxins e.g. pesticides
- Stress, emotional comfort /discomfort
- Culturally important plants or animals
- Dangerous animals (e.g. snakes)

12. Do different agricultural practices require different *types* of work? (***Probe for physical difficulty, monotonous vs. careful attention, skilled (certain adults) vs. easy for anyone (children can do))***
    a. Do different agricultural practices require different amount of skill or knowledge (know-how)?
    b. Which ones?
    c. Which type do you enjoy doing (skilled vs. easy for anyone, monotonous vs. detailed)?
    d. How much does this preference influence the types of practices you choose to use?
13. Are there other reasons that farmers might prefer to use one set of practices (more agroecological vs. less agroecological) that we haven't discussed yet?

Section 3: Typologies

Note: we suggest having a diagram or picture to show these typologies.

14. We found that these farmers are using more agroecological practices: (***describe types based on farm characteristics, practices themselves***)
    a. Do you agree that these characteristics influence what agricultural practices a farmer is using? Why?
    b. Are there any other factors that influence what agricultural practices a farmer is using that aren't captured here? What are they?
    c. Can everyone use these practices? Why? Why not? (Probe for labor)
    d. Would everyone *want* to use these practices? Why? Why not?

15. We found that these farmers are using fewer agroecological practices: (***describe types based on farm characteristics, describe the practices)***
    a. Do these characteristics influence what agricultural practices a farmer is using? Why?
    b. Are there any other factors that influence what agricultural practices a farmer is using that aren't captured here? What are they?
    c. Can everyone use these practices? Why? Why not?
        i. Would everyone *want* to use these practices?

16. We found these different types of farms in your community ***[describe general socio-economic, farm structure characteristics of typologies]*** Does it make sense to group farmers like this?
    a. Do you think most farmers in this typology are similar in terms of pre-existing livelihood conditions?
    b. Is there another way that you would group "similar" farmers in your community? Can you tell me more? Based on what characteristics?

17. Do you think farmers in each group would use the same agricultural practices, or different ones?
    a. Why or why not?
    b. How would they be different?
    c. Why?

18. Do you think that if a farmer from a different group used the practices used by farmers in another group, they would have the same benefit for them? Why or why not?
    a. What benefits would farmers in Typology X get from using these practices?
    b. Would farmers in typology X get the same benefit?

19. Do you think that these farmers in the same group are similar enough that you could measure labor on one farm, or food security on one farm in this group, and then assume that other farmers in this group might have similar outcomes?

Appendix 6: Data processing of the Focus group discussion of Step 6

Information needed to track data, not used in analysis	
Interviewer names	
Interview date	
Interview location	
Number of participants	
Information needed to contextualise responses, could be used in analysis	
Number of male and female participants	
Age or other key description of participants e.g. older women, experienced agroecology project members	

Sample form for summarizing data to be used in analysis (not all questions included)

Topic	**Responses**
Survey results	
Any findings consistent with what you know of community?	
Survey results which are contradictory	
Survey results which are surprising	
Typology and Pile sort activities	
Agricultural practices missing	
Practices that are most important to *earn more money*	
How they earn more money using this practice?	
Do farmers use these practices?	
Practices that are most important to *improve food security*	
How they *improve food security?*	

Do farmers use these practices?	