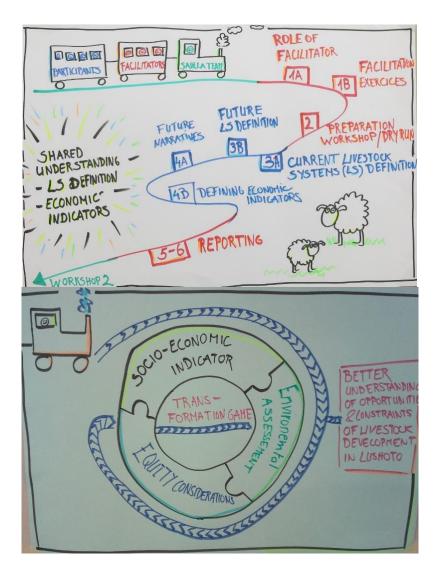# Facilitating the ResLeSS process

A learning process for inclusive, context specific planning in the livestock sector

June 2019

Facilitating the ResLeSS process: A learning process for inclusive, context specific planning in the livestock sector

June 2019

Authors:

Joanne Morris[1], Jonathan Ensor[1], Corrado Topi[1], Catherine Pfeifer[2]

[1] Stockholm Environment Institute (SEI), Department of Environment and Geography, University of York (UoY)
[2] Research Institute of Organic Agriculture, Switzerland (FiBL), previously International Livestock Research Institute (ILRI), Nairobi

This project, 'Research and Learning for Sustainable Intensification of Smallholder Livestock Value Chains in Burkina Faso, Ethiopia and Tanzania' (ResLeSS), is part of the Sustainable Intensification of Agricultural Research and Learning in Africa (SAIRLA) Programme. It is led by the Stockholm Environment Institute (SEI), in collaboration with the International Livestock Research Institute (ILRI), Environment and Climate Research Center (ECRC) at the Policy Studies Institute (PSI), Institut de l'Environnement et de la Recherche Agricole (INERA) and Sokoine University of Agriculture (SUA). The project is working with the CGIAR Livestock CRP Country Coordinators, ICARDA in Ethiopia, and ILRI in Tanzania and Burkina Faso.

Funded by the United Kingdom Department of International Development (UK DFID), SAIRLA is a five-year programme (2015 to 2020) that seeks to generate evidence and design tools to enable governments, investors and other key actors to deliver more effective policies and investments in sustainable agricultural intensification (SAI) that strengthen the capacity of poorer farmers', especially women and youth, to access and benefit from SAI in Burkina Faso, Ethiopia, Ghana, Malawi, Tanzania and Zambia. The SAIRLA programme is managed by WYG International Ltd and the Natural Resources Institute, University of Greenwich.

This document was made possible with support from the UK Department for International Development. The contents are the responsibility of the producing organization and do not reflect the views of UK DFID, the British Government, WYG, nor the University of Greenwich - Natural Resources Institute.

The project thanks all donors and organizations who globally supported its work through their contributions to the CGIAR Trust Fund.

© 2019

Contents

Acronyms

Acronym	
CGIAR	Consultative Group on International Agricultural Research
CLEANED	Comprehensive Livestock Environmental Assessment for improved Nutrition, a secured Environment and sustainable Development
CRP	CGIAR Research Program
DFID	UK Department for International Development
ECRC/PSI	Environment and Climate Research Center (ECRC) at Policy Studies Institute (PSI)
FiBL	Research Institute for Organic Agriculture
GHG	Greenhouse Gas
ICARDA	International Center for Agricultural Research in the Dry Areas
ILRI	International Livestock Research Institute
INERA	Institut de l'Environnement et de la Recherche Agricole
KPI	Key Performance Indicator
Max	Maximum
NGO	Non-governmental organisation
NRI	Natural Resources Institute
ResLeSS	Research and Learning for Sustainable Intensification of Smallholder Livestock Value Chains
SAI	Sustainable Agricultural Intensification
SAIRLA	Sustainable Agricultural Intensification Research and Learning in Africa
SEI	Stockholm Environment Institute
SUA	Sokoine University of Agriculture
UK	United Kingdom
UNB	Université Nazi Boni de Bobo-Dioulasso
UoY	University of York

Executive Summary

This training document is part of a training package prepared for those wishing to repeat the social learning process undertaken in the ResLeSS workshop in Burkina Faso, Ethiopia and Tanzania, as part of the SAIRLA project.

The Training Package comprises:

- A guide to conducting the social learning process and the Transformation Game (this document)
- A generic manual describing the CLEANED R tool that is embedded in the Transformation Game, "The CLEANED R tool: Generic Manual" (Pfeifer et al., 2019)
- A description of the CLEANED R tool for each study site, including study-site specific parameters and model assumptions, livestock categories and selection of pre-set options available.
    - "CLEANED Documentation: Conceptual overview of CLEANED and parameterisation of a CLEANED tool for Bama, Burkina Faso" (Pfeifer et al., 2018b)
    - "CLEANED-R Documentation: Conceptual overview of CLEANED and parameterisation of a CLEANED-R tool for Lushoto, Tanzania" (Pfeifer et al., 2018c)
    - "CLEANED-R Documentation: Conceptual overview of CLEANED and parameterisation of a CLEANED-R tool for Atsbi, Ethiopia." (Pfeifer et al., 2018a)
- A 2 page guide to using the RShiny online interface of the CLEANED R tools

1   Introduction

Aim/Objective: To provide a process that supports multiple stakeholders to build a shared understanding of opportunities and constraints in achieving a sustainable livestock sector in a study area, to contribute to national goals of both: i) improving nutrition and livelihoods through livestock; and ii) protecting the environment and reducing environmental impact.

Approach: The Transformation Game: using design principles for creating the enabling conditions for social learning (Colvin et al., 2014; Ensor, 2011), combined with a computer-based decision-support tool to provide environmental impact information (CLEANED R, Pfeifer, 2019; Pfeifer et al., 2019) and a participatory economic approach to provide information on stakeholders' goals for improved livelihoods.

Farming systems are complex, and even more so when taking into consideration the surrounding lives and conditions of those involved in farming and the rest of the food system. In addition to the suitability of the land (soil, climate etc.), the variety of social networks, cultures, traditions, institutions providing support or guidance, economic opportunities and conditions, and the historical evolution of all these aspects, produces unique contexts within which farming occurs and the food system which it supports. This context differs from place to place. Communities, households, and the individuals within households all have a unique experience of the context. Individuals frequently have different priorities, that is, the things they find important for helping them to reach the goals that they have for themselves or for their families.

At the same time, the number of demands on land is increasing, from increasing population, urbanization and the other land uses, meaning that the food system needs to produce more (to feed a growing population) on the same or less land. It is also recognized that agriculture, and livestock in particular, have a significant impact on the environment. They use a large portion of natural resources, emit greenhouse gases (GHGs), and current forms of intensification are recognized to be unsustainable – demanding more inputs and producing more pollution and often with negative outcomes for human and animal wellbeing. Combined with increasing uncertainty of climate change impacts on natural resource systems, this calls for a more strategic use of land, and better design and management of food systems (Erb et al., 2016). Livestock is a good example; it is a great opportunity in developing countries to increase nutrition and provide livelihood opportunities that can hedge the risk of drought in increasingly arid regions. However, management of livestock needs to change. Avoiding the potential negative environmental and social effects of livestock intensification is one of the greatest challenges facing developing countries. Recognising the diversity of contexts, it makes sense to consider a variety of pathways through which to change livestock production, and to develop context-specific strategies that are most relevant in each setting as there may be multiple ways to meet the same outcome (Giller et al., 2011; Mehrabi et al., 2017).

Governments are called upon to reduce malnutrition, improve livelihoods, conserve natural resources and reduce greenhouse gas emissions. Trying to achieve all these goals in livestock production can lead to many contradictions. For example:

- between environmental and social gains: reducing livestock production to use less resources may give less opportunity to improve livelihoods,
- between different environmental gains: reducing livestock production reduces manure production which reduces the opportunities for improving soil fertility,
- between the socio-economic priorities of different actors,
- and between different ways in which a given socio-economic gain can be realised in terms of environmental costs.

It is increasingly recognized, in different fields of research, that making changes to these complex systems requires learning and sharing of knowledge and experiences between individuals from different parts of the system (e.g. Collins and Ison, 2010; Ison et al., 2007; Blackmore, 2007; Fazey et al., 2007; Berkes, 2009; Armitage et al., 2009). Only once you know that someone else has a different view on an issue, or a different objective to reach, can you start to work together to resolve it (Bouwen and Taillieu, 2004). You can think of it as each individual, from their experience of working in their part of the system, has one or more pieces of the puzzle, but not the overall picture. Only once individuals meet and share their pieces can everyone get a

better view of the overall picture. We adopt a social learning approach to help design a participation process and space for engagement in such a way that makes it conducive for learning, that encourages and supports individuals to come together and share their knowledge (Collins and Ison, 2009; Colvin et al., 2014).

This process aims to encourage openness, support people to feel free to contribute, and provide a space where individuals can share their knowledge and learn from others, and together build new knowledge on how to make changes that work better for all (or, at least, are acceptable to all). In this process, individuals represent others who are in similar roles or situation, while accepting that they will not have exactly the same experiences or knowledge.

To achieve the goals of social learning requires high quality design and facilitation of the process, and supporting engagement between stakeholders is crucial (Colvin et al., 2014). Some good references for improving one's facilitation skills are listed in Chapter 7.

Purpose of the manual

This manual is written for those who would like to repeat the participatory social learning process that we used in the ResLeSS project. This might include local/international researchers, non-governmental organisations (NGOs), or district offices. Readers will have a range of experience of running workshops and so if something seems obvious, please bear with it!

Note that this is not a fixed design but can and should be adapted to fit the setting in which this process will be played out. We have added examples from our experience of working in three different contexts, illustrating how aspects may differ.

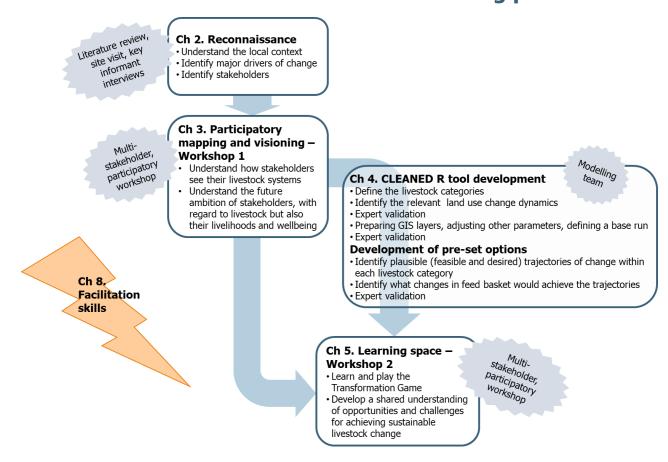## 1.1   Overview of the ResLeSS social learning process

Figure 1: Diagrammatic overview of the facilitation manual.

1.1.1 The participatory environmental assessment approach

The environmental assessment approach involves embedding the CLEANED R tool, a rapid ex-ante environmental assessment simulation tool, into the social learning approach, using the mechanism of the Transformation Game to support engagement. As such, the tool provides a support to discussions, and it is not an end in itself.

The Transformation Game aims at engaging decision makers in a social learning process through which they learn about synergies and trade-offs in their particular context, with a view to developing an inclusive future vision for the livestock sector in their area. Decision makers are defined as those agents who take decisions related to the livestock sector. Therefore this definition includes policymakers, as well as all players along the livestock value chain, including retailers, middlemen, and farmers.

A key reason for embedding the CLEANED R tool in the Transformation Game is that the CLEANED R tool does not provide answers. It provides information about potential changes in key environmental variables (water use, soil nitrogen balance, greenhouse gas emission, loss of habitat and land use) and meat and milk production. **It does not make the judgement about whether these changes are acceptable or not** because there are countless factors related to the socio-economic and biophysical context that influence what impact these changes might have. Therefore, the Transformation Game defers assessment and judgement of the information to a collection of interested and invested experts (the actors, local or other, who will be affected by or make decisions on the impacts).

The CLEANED R tool is a quick and spatially explicit simulation tool that computes environmental impacts from livestock production (Pfeifer, 2019; Pfeifer et al., 2019). This means that it is quick to set up for a new area, and uses spatially disaggregated data as the input to the calculations so that the results, while relatively coarse, are better than when using average values for the study area. As such, it aims at balancing context specificity and speed of implementation. On the one hand, generic models are often available for any part of the globe after the first investment of time in developing the tool, but may be too general to support decision-making on the ground because they are not sufficiently context specific. This is particularly true for the African continent, which often is not comparable to the Western contexts for which these generic models were developed and parameterised. On the other hand, studies that collect their own context-specific data for one site give much more accurate results, but often need years to acquire and analyse the data, defying the need of policy makers to take immediate decisions. The principle of the CLEANED R tools is that they are designed to be developed for a new area within weeks and yet give results that are good enough to support policymakers in a context-specific manner. To achieve this, the tools make use of readily available data only, refining that secondary data with expert knowledge. The tools combine globally available medium and high resolution geographical data, i.e. data that are spatially disaggregated and therefore context specific, with expert information derived from key informant interviews and/or a participatory stakeholder workshop.

1.1.2 The participatory socio-economic approach

Our approach to economics looks to integrate considerations of social justice, democratic participation and environmental sustainability into the foundations of the economic model. Conventional approaches to economics are restricted in that they consider value in terms of money: profit, loss, cost of production, labour costs, gross domestic product … and so on, all are terms that are familiar. Here, we are interested in taking a wider view of 'value' to include those things that different people consider to be important in relation to livelihoods: this usually includes money (or cash income) only as part of a life vision made of less easily quantifiable aspects such as quality of life, wellbeing, plans for their children and family, respect of others, family security, mastery and social recognition, the ability to influence policy and decision making, identity and long term impact on the environment or their community.

In this socio-economic approach, we are looking to capture this overall vision and these wider components of 'value' to construct a collective local economic vision from different stakeholders, in a set of participatory engagements. This can then be used to help evaluate the desirability of different future livestock livelihood scenarios.

The process involves capturing the diversity of stakeholder priorities that are present in the workshop, and clustering them into a manageable number of common themes. Key Performance Indicators are derived to support stakeholders in evaluating the achievement of the priorities identified in the themes. These common indicators should still in some way represent the diversity of perspectives, while recognising the significance of outliers to some groups and capturing variation.

The socio-economic approach is structured in two phases within the broader social learning process (Figure 2). In the first phase, in Workshop 1, we look to generate a 'narrative of success' which integrates different perspectives into a collective future vision. This narrative allows stakeholders to co-define indicators of success that value their interests. To define the narrative of success, homogeneous stakeholder groups describe a day in the life of a family or individual in 10 years' time who, in their eyes, has been successful (A5, Figure 2). From these narratives, each group identifies key aspects that could become indicators (A6, Figure 2) and then select their top 5 indicators by individual, secret voting (A7, Figure 2), producing a large set of indicators that should capture the interests of every stakeholder in the room. Workshop 1 ends with a plenary reflection on the variety of indicators, identifying where they overlap (commonalities) and where they do not (differences) (A8). Phase 2 is undertaken during Workshop 2, and focuses on refining the top 5 indicators (or 3 if time is short) to make them measurable and specific (A1, Figure 2). Collectively, the stakeholders iteratively suggest draft clustering and revise it (A2). The objective of Phase 2 is to produce a short list of common or 'combined indicators' (also considered to be Key Performance Indicators, KPIs) that reflect in some way the broader-than-money interests of the variety of stakeholders. This short list is then used in the Transformation Game to evaluate the proposed livestock scenarios, to consider to what extent that livestock scenario would contribute to achieving the stakeholders' socio-economic priorities. This therefore offers the stakeholders a measure by which to evaluate the socio-economic sustainability of the proposed scenario.
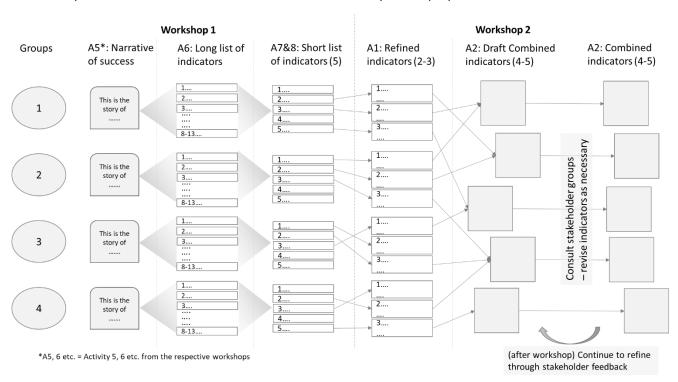

Figure 2: Overview of the socio-economic process, of eliciting and extracting a few Key Performance Indicators

2 Preparing for the workshops

2.1 Reconnaissance Tour

Time: 2-3 days   **Responsible:** Modeller(s)

Format: Transect tour and semi structured interviews

Output: A better understanding of how to represent the study area in the model

Materials: Time, transport, key informants

The purpose of the reconnaissance tour is for the modeller(s) to become acquainted with the study area and identify key characteristics and dynamics that need to be correctly represented by the model.

If the modeller(s) are local to the study area, this step may be more a refresher to look at the area with a view to creating the model. This reconnaissance tour therefore takes the form that is most practical to the modeller(s) and study area, but should not be skipped.

In our project, it took the form of a 2-3 day visit with some semi-structured discussions with key informants and a transect drive through the study area to see the landscape and stop to talk to people working the land. Some of the best insights are gained from randomly stopping to talk to someone on the side of the road, and from doing some exploring off the main road.

Examples of questions that can be considered during the reconnaissance tour include:

- How is the land used? In terms of what crops are planted that could provide residues to livestock? What different types of land use are there? The modeller(s) will need to categorise the land use map into 'cropland', 'grazing land' and 'excluded' land, so the reconnaissance tour can be a useful opportunity to see how the landscape looks in terms of re-classifying the land use map.
- Is all available cropland being used, what is the potential for land use change?
- What are the common livestock that you see? How are they being kept (free range, indoors)?
- What different feeds are people using (this also comes from the first workshop)?
- Is there trade in locally produced feed such as hay, grass, green feed, crop residues (not concentrates)?

2.2 Participant selection and other practicalities

Participants

Part of the reconnaissance phase before the first workshop is to identify participants who are representative of the people who are in some way connected to the livestock value chain and who are or will be affected by changes to the value chain, i.e. the stakeholder groups. In our project, we identified stakeholder groups based on key actors in the value chain that had been identified in previous scoping work by CGIAR Research Programme on Livestock and Fish's Value Chain programmes in each country. These included producers, traders, input suppliers, processors, consumers and actors in support or research roles such as government officials, district administration, extension services, NGOs and local research institutes.

Groups

Each workshop is structured in two sessions where two very different approaches are used. In general, each session is one day long. The first session of the first workshop calls for mixed groups, where we have representatives of all the different stakeholder groups, to maximize the diversity of each group in order to

produce a more accurate characterisation of each livestock system[1]. During the second session of Workshop 1, the focus is on empowering stakeholders to share their perspectives and priorities, which are likely to be different between stakeholder groups, and therefore calls for homogeneous stakeholder groups, in order to strengthen the 'voice' of each stakeholder group and consolidate how they will represent their views. The first session of Workshop 2 maintains these homogeneous stakeholder groups. Then the final session of Workshop 2 mixes all stakeholders again into two (or more) large mixed groups to encourage shared learning and joint planning.

Group sizes should ideally be around six to eight participants, even if circumstances may compel the use of larger group sizes. For example, in workshops with more than thirty participants, these stakeholders may be divided into four groups of more than eight. Groups of larger sizes makes it difficult for everyone to participate, whilst smaller groups restricts the diversity of knowledge and experience that can be brought into the discussion. However, more groups means more facilitators, so there will be a pragmatic balance when planning the workshop. 'Homogeneous' stakeholder groups should gather stakeholders together, such that they have more in common with the stakeholders in their group than they do with stakeholders in other groups.

It is important to consider in advance of Workshop 1 how to distribute the participants into mixed groups for the first session and homogeneous stakeholder groups for the second session. Consider allocating them to these groups at registration. In advance of Workshop 2, consider how to divide the homogeneous groups again into mixed groups (see Section 5.4.2).

Facilitators

For the workshops, good facilitation of the group discussions is essential, and therefore each group should have a dedicated facilitator. In our project, we also had a second facilitator for each group to make notes and document the discussions. The facilitators should, above all, be able to speak the language of the participants! Consider whether it may beneficial if the facilitators possess basic knowledge about livestock, so that they are able to provide support if the participants do not understand something. There is, however, an important trade: knowledgeable facilitators might be tempted to add their own assumptions and knowledge into the group discussion, and this should be avoided. The role of the facilitator is to guide the discussion, not to contribute to it. In this respect, someone who is not familiar with livestock may draw out the participants more, out of natural desire to understand what they are discussing, leading to richer discussions.

Throughout, 'facilitator' is used to refer to the two roles: i) guiding the group through the activity; ii) taking notes and recording on flipcharts. The facilitator and note-taker rely on each other and therefore should know each other's tasks and ideally should get to know each other beforehand. From session to session, the two facilitators can switch roles if desired so that both are facilitator for part of the day and note-taker for part of the day. A third task - observing and reflecting on the group process – is for both facilitators to undertake.

Training the facilitators

Allow time before each workshop to train the facilitators. Remind them of important facilitation tips and skills (before the first workshop, this might be a more formal training on facilitation skills), and introduce them to how the workshop will unfold. This includes the activities, their responsibilities in each activity and any reporting requirements.

Training should allow time to rehearse how the workshop will play out, helping to identify any activities that should be modified to be relevant to the local context and culture.

Language

Ideally, the workshop should take place entirely in the local language, and some or all of the implementing team should speak the local language. If the implementing team is an international research project, language is something to be taken into account. Translation between workshop leaders and participants takes time, and the workshop leaders need to rely on translation to get a feel of how the discussions are going.

---

[1] There is a diversity in terminology describing livestock keeping. We will refer to 'systems' or 'categories' in this document, to mean the animals and the feed and management associated with them, which might be called systems/ practices/ types/ categories etc. by others

Where possible the material for the workshops should also be in the local language.

Things to consider in planning the agenda

Consider usual working day practices for timing of coffee breaks and lunch. In particular, consider any religious or cultural obligations like prayer times, that people usually observe during the day, and make sure to time the breaks to accommodate these. This was particularly relevant for the pastoralists and other participants in Burkina Faso who were more devout. In Ethiopia and Tanzania, breaks were not needed to observe prayer times during the workshop hours, except during Ramadan in Tanzania.

Consider the timing of the workshop in general, to try to take account of busy times of the cropping year, festivals, and try to avoid fasting times, as the workshops are quite intensive.

Consider also the need for people to travel at certain times, the safety and security of the participants, and the climatic conditions in relation to both travel and hosting the event. For example, travelling at certain times of the year may be difficult because of temperature, street conditions, rainy season or because insects or animals are particularly active at certain times.

Be aware that it may be necessary to provide tailored support to some groups to enable their participation – for example, where lone women need to travel to the workshop, or ensuring disabled stakeholders can travel to and access the workshop venue and materials. It may also be the case that not all participants will be able to read.

3   Workshop 1 Participatory mapping, exploring livestock and wellbeing

Time: Up to 6 days   **Responsible:** Project team

Format: Two day workshop + 2 day facilitator training (before) and 2 day report writing (after)

Output: Input for the Transformation Game and CLEANED R tool; increased understanding of other stakeholders' perspectives, knowledge and priorities with regard to livestock livelihoods in the study area

Materials: Workshop venue, workshop materials, 8 facilitators, participants

The first workshop has the objective of gathering the information needed to prepare for the Transformation Game in the second workshop. It has two parts: i) in Part A, mixed groups of stakeholders provide information needed to develop the CLEANED R tool, on current and desirable future livestock systems; ii) in Part B, homogeneous stakeholder groups identify what their socio-economic priorities are by creating a story of a successful person, and from this story identifying 'good life indicators', or socio-economic indicators of well-being, which will become the Key Performance Indicators (KPIs) in Workshop 2.

The workshop concludes by exposing the similarities and differences in perspective between the stakeholders. This sets up Workshop 2, which is focused on a process of reconciling the different visions of the future, supported by the use of CLEANED R to demonstrate the environmental implications of different scenarios. The project team, facilitators and the participants are taking a journey together to shared understanding (Figure 3). A well-designed and facilitated workshop will ensure that no-one falls off the train or gets left behind.
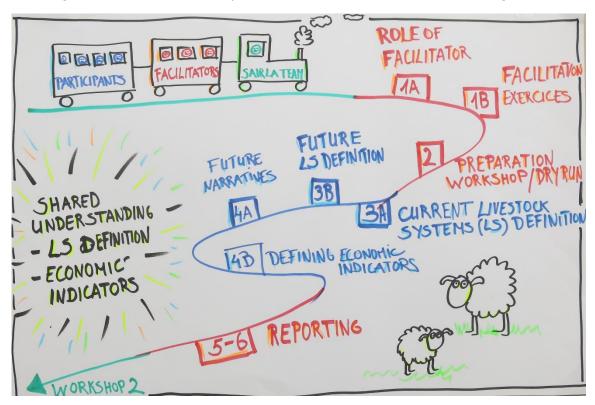

Figure 3: Illustration of workshop phases, for discussion with facilitators and participants.

The two parts are carried out over two days, as in the following broad agenda (Table 1 & 2). Note: lunch and coffee breaks are omitted; design these blocks flexibly around breaks, and be prepared for further flexibility in accommodating, or managing, people talking too long.

If an ambition is to track learning (see section 6) with the use of pre-post questionnaires, consider doing these in advance of the workshop rather than at registration, as Day 1 is very full.

Table 1: Guideline agenda to Day 1 of the first workshop

Time	Activity	Led by/Format	Details	Materials
DAY 1				
Block A: Introduction				
45 min	**Welcome**	Workshop leader Plenary	Welcome, getting to know each other with ice-breaker activity.	
45 min	**Introduction to workshop**	Workshop leader Plenary	Presentation of the ResLeSS learning approach, aims, objectives and components, introduction to the agenda, and setting rules of engagement.	
Block B: Definition of the livestock production systems in the area of interest				
During tea break	**1) Current livestock system definition**	Workshop leader Snowballing activity	Brainstorming to generate a list of existing systems and identify which are more common using the snowball technique. At the end of this activity assign a system to each working group.	Tea/coffee and ideas
1.5 hr	**2) Current livestock system characterization**	Group facilitators Four mixed groups (1 system per group), then plenary	Participatory mapping: Group facilitators introduce maps to group by identifying the boundary of their livestock system, then: i) draw on the map the location of livestock and where feed comes from; and ii) describe number of production units and animals, feed resources, and management characteristics for the system. Present outputs in plenary to gather edits from others.	Base maps (land cover etc.), transparent sheets, flipcharts with template, pens
Block C: Future visioning and future livestock system definition				
1 hr	**3) Future livestock production systems definition**[a]	Workshop leader Individual work, then small groups and plenary	Letter to the next generation & journalist group interview: Objective to guide participants in envisioning the future, to describe the livestock systems in the area 10 years from now, how current systems have changed, what the most successful farmer does, what the poorest farmer is doing. Let participants write a letter to the next generation alone[b], then (voluntarily) discuss the future systems in small groups before moving back to plenary. Identify four future systems to allocate to groups.	Paper and pen, and imagination
1.5 hr	**4) Future livestock production systems characterisation**	Group facilitators Four mixed groups (1 system per group), then plenary	Participatory mapping: i) draw on the map the location of the future livestock system and where feed will come from; and ii) describe number of production units and animals, feed resources, and management characteristics for the future system. Present outputs in plenary to gather edits from others.	Base maps (land cover etc.), transparent sheets, flipcharts with template, pens
	Close Day 1	Workshop leader Plenary	Brief reflection on learning from the day and reminder of what will happen on Day 2.	

[a] Be creative with the session – different methods work better in different cultures.

[b] Be aware of literacy levels in the participants and be flexible/accommodating in facilitation.

Table 2: Guideline agenda to Day 2 of the first workshop

			DAY 2	
Time	**Activity**	**Led by/Format**	**Details**	**Materials**
15 min	**Welcome**	Workshop leader Plenary	Recap of Day 1, and overview of Day 2	
Block D: Narratives (stories) of success				
1.5 hr	**5) Creating narrative of a successful day**	Group facilitators Four stakeholder groups	Group facilitators support groups in developing their narratives, providing prompts/cues/questions to stimulate discussion. Produce a one page description of one day in the life of a successful individual or family of the future	Flipchart, marker pens and recorder
Block E: Identifying indicators of success				
1.5 hr	**6) Finding indicators in the narrative**	Group facilitators Four stakeholder groups	Group facilitators support group to identify key aspects in the 'narrative of success' and define indicators to identify when each aspect had been achieved. Discuss how you might measure the indicator (qualitative or quantitative). Note that discussion of indicators may lead to a revision of the 'narrative of success', as thinking in terms of indicators may reveal assumptions or overlooked aspects of the narrative.	Flipchart, marker pens and recorder
	Prepare ballot papers	*Group facilitators*	*List all indicators that the group identified on an A4 sheet in a table, and make enough copies for each member of the group*	*A4 paper, pen, (photocopier/ printer)[a]*
35 min	**7a) Ranking indicators - voting**	Group facilitators Individual work	Vote individually for your top indicators by secret ballot, to reduce the indicators from 10 indicators to the top 5	Copies of ballot papers, stickers
10 min + 15 min	**7b) Ranking indicators - results**	Group facilitators Four stakeholder groups	• Count the votes from the ballot to get top 5 • If tie between 5 and 6, discuss as group which one should be # 5 • Write out each indicator on a separate card for presentation, in local language and team's language	Coloured card or paper, marker pens
Block F: Sharing indicators of success				
1.5 hr	**8) Reflecting on indicators**	Workshop leader Plenary	• Present top 5 indicators with brief description of what it means and how to measure it • Open discussion on similarities and differences between indicators from different groups. This is about sharing knowledge and learning from others about their priorities. There is no need to try to cluster indicators or come to consensus.	Coloured cards from each group, post-its, marker pens
Block G: End of Workshop 1				
0.5 hr	**Closure**	Workshop leader Plenary	Reflection on the two days, thank-yous, what will happen next. Ask individuals to fill in post-workshop questionnaires (if doing these, see Section 6).	Post-workshop questionnaires

[a] Be pragmatic or creative here. For example, if there is no photocopier or printer easily available, print a blank table in advance and ask participants to write the indicators out for themselves, or group facilitators and a few group members.

3.1 Day 1: Environment and the livestock system

3.1.1 Block A - Welcome and introduction

Time: 1.5hrs

A formal welcome followed by introductions to the team; consider having an icebreaker exercise to get to know everyone, or do that in smaller groups. Consider including the following in the introductory remarks:

- Many thanks for coming and to the host in particular for hosting us today
- These workshop are a place where we are looking to understand what might happen in future livestock livelihoods – so for this we need to take into consideration the views and knowledge of the farmers and traders, but importantly also the policy makers, community leaders and those who have the capacity to influence change that could generate positive outcomes for those connected to livestock
- This will mean that we are able to bring together all those with responsibility for meeting the huge challenge of feeding ourselves, the nation of xxx and the region today and into the future, in [ten years from now or so]

Introduction

- A brief overview:
  - Project/process aims and objectives: creating an enabling space to learn from each other, by considering how livestock might change in the future, what changes this might have on water use, soil nitrogen balance and greenhouse gas emissions. But to help evaluate whether these changes are acceptable or not, we want to understand social and economic changes this might bring about. We want to be inclusive and encourage greater equity in future livestock by providing an open space where every individual's opinion and knowledge is equally valuable and encouraged.
  - Summary of process: some knowledge already gathered about the area before the workshop, now this first workshop to map out the livestock systems that should be represented in a software tool (CLEANED R), then the team will develop the tool, and there will be a second workshop where you'll have the chance to 'play' with the tool to explore future options and their implications.
- Workshop outline
  - What we are trying to achieve:
  - Identification and description of common or important livestock keeping – and more importantly how you think about them and classify them – and how it could conceivably change in the future.
  - Identification of what can be considered a 'success' and how you would know if someone has been successful - to do this we need to identify indicators of success.
  - We hope that this will generate a better understanding among all stakeholders.

Rules of engagement: Setting the rules of the space

- When you're in this space you are "Explorers of the future" (or a similar local idiom)
- This means:
  - We all contribute because we all have a different "view" of the future
  - No question is foolish – if you are unclear feel free to ask
  - If you have comments, all opinions are valuable
  - No threats are allowed; only respectful discussion of different views
  - Please do not express views on other people or on other people's opinions
- Translation will be provided where necessary; main language is [local language]
- Cellphones on vibrate, please answer calls outside the explorer's space

3.1.2 Block B - Describing current livestock systems

Activity 1: Snowballing negotiation

Time: 0.5 hr   **Responsible:** Group facilitators

Format: Snowballing brainstorm

Output: 4[2] common livestock systems/practices/types of livestock keeping that will be described in groups

Materials: none (perhaps blank paper to make group labels)

Summary: In pairs list all the types of lived keeping you think are most important, then join another pair and combine notes, join another group of 4 and combine, and so on until you come together in one group to consolidate a common way of describing the most common and/or important livestock categories in or for the study area.

The aim of this activity is three-fold. First, an energiser after all the introductions. Second, to identify systems for the groups to describe in Step 2. The most important aim, however, is to collectively gather the terms and language with which livestock keeping is described in the local area, and if there are differences among the stakeholders in how livestock is categorised, then this activity is the moment to negotiate a shared resolution. This is important because the livestock categories that will appear in the CLEANED R tool will be based on the outcome of this snowballing session, so that the tool 'speaks the same language' as the users (the local stakeholders). If the users do not recognise the livestock in the study area in the categories used in the tool, the tool will be rendered irrelevant.

ResLeSS example:

We found differences in how participants classify livestock keeping or production, which sometimes created a heated discussion. Livestock could be seen as the animals themselves, therefore for some it makes sense splitting by type of animal, perhaps by breeds within a type of animal. Others view livestock in terms of the livestock products they obtain from the animals, i.e. meat or milk…. Another distinction is by livestock practices - how the animals are kept. Talking of 'systems' is perhaps more for academics, and on its own does not specify which classification system is being used. Other terminology could be livestock practices, livestock products, livestock breeds, and others. The CLEANED R tool refers to 'livestock categories' to remain flexible to accommodate this diversity of terminology.

Facilitation:

In this snowballing exercise, the objective is to gather and consolidate all the ideas in the room fairly quickly. Repeated ideas will automatically be merged while unique ideas will be retained, unless meeting a good argument for why it should be dropped.

Ask participants to start in pairs and to discuss how many livestock systems they can identify in the study area. When a pair has an agreement, then they look for another pair and agree now in a group of 4 about the number of livestock systems. When there is an agreement, the group of 4 finds another group of 4 to discuss the same issue.

---

[2] As many systems as there are groups in the workshop, as each group will be assigned to describe one system in the next activities. In our project, we had four groups.

When the participants are in 2 or 3 bigger groups, the facilitator draws the groups together and asks the groups about the numbers of systems found in the area, and starts a facilitated negotiation about the number of systems - and what they are.

If less systems are identified than there are workshop groups (in our case, four), assign each group a system and double the most common or most interesting one to get four groups. If more than four systems are identified, then negotiate with the group which ones can be omitted or merged together.

Activity 2: Current livestock production systems characterisation – participatory mapping

Time: 1.5 hrs   **Responsible:** Group facilitators

Format: Mixed groups, each describing a different system, as allocated in Activity 1

Output: A description of the location and management of the **current** livestock system

Materials: Base maps (e.g. land cover, soil types, elevation, rainfall etc.), transparent sheets, flipcharts with template for feed and management details, pens for transparent sheet, pens for flipchart

Summary: Groups orient themselves on the maps and collectively draw pertinent features of the livestock system they are describing, in its current form. Key features include the boundary within the livestock are found, where the feed comes from and anything else considered to be important to map. Further details about what feed items, in what proportion (the feedbasket) and livestock management are also listed.

Participatory mapping consists of presenting maps of the study area to the participants and using them as a tool to engage in a discussion around the spatial distribution of livestock systems. To simplify possible geo-referencing[3] of features drawn by participants, the drawing is not done on the printed map directly but on a transparent sheet of film. This means that the base map can be changed or removed during the process, without disturbing the mapping, and that only one set of base maps is needed per group. After the exercise, the transparent sheets can be scanned and geo-referenced. Some prefer to print some reference points, boundaries or road on the transparent film, others prefer to keep it blank to allow creative use of the film.

Facilitation

The first exercise, when introducing the maps to the groups, is orientation. Ask the participants to locate landmarks such as their home, the church or the school, and assist in understanding where necessary.

Then, focusing on the livestock system allocated to them in Activity 1, ask participants where they would consider the boundary of the system to be - within what area would one find the animals of this livestock system in the study area? Local input services and output points might be considered within the boundary as well. For livestock that is commonly found throughout the study area, the study area boundary may be the simplest. A different boundary might be relevant if the livestock are clustered in particular locations within the study area.

1. Percent of household that keep animals in this system
2. The mode[4], minimum (min) and maximum (max) number of animals in this system (total or, if unknown, per household, but specify which)
3. Feed basket for this livestock system in percent (types of feed and what proportion each makes up), including the source of the feed (where farmers collect or buy it)
4. Manure management

---

[3] Matching the physical locations referred to by participants with their location on a map, to be used in a geographic information system (GIS) application such as the CLEANED R tool.
[4] The mode is the most common number; for example, the mode of the number of cattle per household is the number of cattle that most households in the area have.

5. Facilities and Input and output markets

Recording the source of the feed for the feedbasket is very important for coding the CLEANED R tool, for allocating feed types to land use (cropland or grazing land), and is often left out, so double check that the group discusses and records it. This means, where people get the feed from - is it collected? From where? Is it bought? Is it traded locally within the study area or bought from outside the study area?

3.1.3 Block C – Future livestock systems

This block aims to collect ideas about how participants foresee the livestock systems changing in the area – a form of visioning exercise. As such, there is much methodology available to refer to, but this is a very simple version. Activity 3 is a creative exercise, and does not have to take the format described here. Consider what will work in your context to help identify some visions of the future to then map and describe in groups as in Activity 2 (Box 1).

Activity 3: Future livestock production systems definition - Letter to the future generation and journalist interview

Time: 40 min - 1 hr   **Responsible:** Workshop leader

Format: Individual reflection, then small groups, then plenary

Output: A selection of future livestock systems – how current systems might change, or new ones that might appear

Materials: Pen and paper and imagination

Summary: In writing a 'letter to the future', individuals reflect on how they think livestock keeping in the area will look in e.g. 10 years' time, imagining that the area has seen progress, and people have a better life. For example, how current systems have changed, what the most successful farmer does, what the poorest farmer is doing. Share ideas with neighbours, and group facilitators can act as 'journalists' walking around groups collecting ideas for a plenary negotiation and selection of four future systems to allocate to groups for Activity 4.

Facilitation

In order to support participants in starting to think about the future livestock system, participants are asked to write a letter to the future generation describing how they wish that generation will keep livestock in 10 years from now[5]. After the letter has been written, participants share their visions in smaller groups with their neighbours.

Meanwhile, group facilitators become "journalists" who go to the smaller groups to collect their ideas by 'interviewing' them about:

1. Completely new livestock production systems
2. Changes that will have occurred in the current livestock productions systems
3. Livestock production systems that will have disappeared

"Journalists" present their findings in plenary, and a facilitated negotiation takes place to agree on the future production systems. These systems are then assigned back to groups for a participatory mapping exercise as was done for the current livestock systems in Activity 2.

Box 1: Example of Context specificity:

---

[5] The contents of this letter are private, just a tool to help their thinking, and do not have to be shared unless the authors wish to.

Be creative with this activity. But be aware of cultural context when designing it. We have previously gathered everyone onto an imaginary aircraft, to take a flight to the future, with eyes closed as the workshop leader talks through taking the flight, landing and walking out to see what the future holds – perhaps a new hospital here and can see some other new infrastructure in the distance. You stop at a farm – this farmer looks wealthy, with a good establishment. What do you see? Next, you see another farm but this one is not doing so well. What do you see on their farm? After reflecting in silence for a short time, then invite to share in small groups and then back to the plenary. This worked very well in Uganda, and sparked some very diverse ideas for future systems. However, it did not work at all in Sudan – and hence we decided to use a milder activity in ResLeSS.

Consider also literacy when asking participants to write (something we did not anticipate) – can also think quietly on their own what message they would leave for their children. Or perhaps there are local story-telling traditions to draw on. This can also be addressed by the facilitation of the activity. The objective is not to write – writing is a supporting activity to help individuals to reflect and be imaginative.

Activity 4: Future livestock production systems characterisation – participatory mapping

Time: 2hrs   **Responsible:** Group facilitators

Format: Mixed groups from before, describing the system allocated to them in Activity 3

Output: A description of the location and management of the **future** livestock system

Materials: Base maps (e.g. land cover, soil types, elevation, rainfall etc.), transparent sheets, flipcharts with template for feed and management details, pens for transparent sheet, pens for flipchart

Summary: Groups collectively draw pertinent features of the envisioned livestock system they are describing. Key features include the boundary within the livestock are found, where the feed comes from and anything else considered to be important to map. Further details about what feed items, in what proportion (the feedbasket) and livestock management are also listed.

Facilitation

As for Activity 2, focusing on the livestock system allocated to them in Activity 1, ask participants where they would consider the boundary of the system to be - within what area would one find the animals of this livestock system in the study area? Local input services and output points might be considered within the boundary as well. For livestock that is commonly found throughout the study area, the study area boundary may be the simplest. A different boundary might be relevant if the livestock are clustered in particular locations within the study area.

Then characterize the whole system along the following dimensions:

1. Percent of households in the study area that keep animals in this system
2. The mode, minimum (min) and maximum (max) number of animals in this system (total or, if unknown, per household, but specify which)
3. Feed basket for this livestock system in percent (types of feed and what proportion each makes up), including the source of the feed (where is it collected or bought)
4. Manure management
5. Facilities
6. Input and output markets

Recording the source of the feed for the feedbasket is very important for coding the CLEANED R tool, for allocating feed types to land use (cropland or grazing land), and is often left out, so double check that the group discusses and records it. This means, where people get the feed from - is it collected? From where? Is it bought? Is it traded locally within the study area or bought from outside the study area?

3.2 Day 2: Socio-economic priorities

In the welcome to Day 2, after reflecting on Day 1, split the participants into new, homogeneous stakeholder groups. Allow flexibility to check that everyone is happy that the group to which they have been allocated is where they feel they fit best.

3.2.1 Block D - Narratives of Success

Activity 5: Creating a narrative of a successful day

Time: 1.5 hrs   **Responsible:** Group facilitators

Format: Homogeneous stakeholder groups reflecting a degree of commonality in terms of their livelihoods or background (e.g. farmers, traders, policy makers…)[6]

Output: A flipchart with the 'narrative of success' written on it, one for each stakeholder group. This is a shared, positive vision for the future as imagined by each group.

Materials: Flipchart or equivalent per group, i.e. a support where text can be written and recorded, for example using felt tip pens; Felt tip pens (ideally colourful); (possibly) a camera and/or a voice recorder. If using a recorder, please remember to ask for permission.

Summary: Discussion in groups leading to one page description of what a positive and desirable future looks like, in the form of a story of one day in the life of a successful person or household from the area. Facilitators support groups in developing their narratives, providing prompts/cues/questions to stimulate discussion.

Facilitation:

Everyone introduce themselves to each other. The facilitator then explains the aim of the session, to develop the 'narrative of success' with the following guiding specifications:

- The group will tell the story of a standard successful future day (10 years in the future) from the perspective of an imagined community, but in the 'local' area (whatever 'local' may mean) and an imagined person.
- The story of this person, or character, is considered by the group to capture and represent their desires and vision for the future.
- What this character does during the day will be a collection of the views of the group.
- However, what the character does may be a negotiated compromise between the different views within the stakeholder group where there are contradictions or incompatible ideas emerging from the group.
- By telling the story, the group will express their priorities for the future, and also tell the story of the imagined household and the community in which it sits.

The facilitator then needs to set out the parameters of the discussion. The intention is to keep the discussion broad, so that the participants drive the discussion and address issues that are of significance to them. Therefore, the restrictions are limited to:

- Your narrative should be centred on a character who lives within an imagined community in the area where you live.

---

[6] Where more types of stakeholders can be identified than the number of stakeholder groups planned for the workshop activities, then participants should be grouped so that they have more in common with the members of their group than with members of other groups.

- Your character should be connected to the livestock value chain in some way (it would be fine, for example, if the character did not work in the value chain but was married to a livestock keeper, or works in a business, service or decision-making role that in some way is connected to the value chain).
- The group cannot influence external natural context, for example the climate, the geographic location or the topology of the place.

To elicit the narrative, the facilitator would start with a question like:

- "imagine yourself in 10 years' time", or "imagine one of you in 10 years' time"

To make progress, the facilitator might go on to say

- "imagine things are going well, and everything is working according to plan".
- S/he then asks the group: "how do you imagine a typical good day?".

S/he will then try to make sure that the group covers the whole day from waking up to going to bed and all the significant events of the day are represented for a good day, trying to avoid discussion on how bad a situation is in the present. If that should happen, then s/he will try to use the information provided to help the group think about what would be the best possible alternative to the current (bad) scenario. For example, if talking about transport to the market people start complaining about the current bad state of the roads, s/he may ask "what should a good road look like for you?" or "Could you describe the perfect way to take your animals to the market?"

If s/he notices that some issues related to the night time are particularly important to the group she will also try to cover the night. For example, for those situations where household night safety is a concern or if the stakeholder desires to carry out certain activities at night, such as milking, travelling or praying for example, these should be included.

At intervals, the facilitator will retell the group the narrative that is coming out of the conversation. Typically, the first time would be when they reach important moments of the day: for example, when the narratives reaches lunchtime. Whilst the conversation normally progresses autonomously, the retelling of the story becomes also important whenever the discussion grinds to a halt, to restart the conversation.

To increase empathy of the group towards the character they created, the facilitator will try to make sure the group gives a name and a personal story to the character relatively early in the meeting, for example when they are narrating the breakfast time.

Conflicting views

If a conflict of views emerges among the participants the facilitator will attempt to reach a negotiated solution: a conflict happens when very different views emerge within the group on some essential parts of the description of the day. A good example would be whether the older children should be going to school or be working alongside their parents in the farm. In this case, a negotiated solution would be that one of the parties accepts that up to certain age the children should be allowed to go to school, whilst the other parties accepts that after that age it is acceptable if they study in the morning and work alongside their parents in the afternoon. If a negotiated solution fails to be achieved, then the facilitator will make sure the conflicting views are represented in the narrative. In the example, the facilitators will make sure both versions are recorded.

Closing

Once the day is complete, the facilitator retells again the story to the group so that the members of the group can add further details and enrich the story.

At 5 minutes from the end, the facilitator will remind the group that the session is drawing to a close and freezes the story. The facilitator and the person who supports will then proceed to record the story in front of the group, with the facilitator retelling the story and the support person using either an audio recorder or pen and a large sheet of paper to record the narrative.

The session concludes with the facilitator asking the stakeholders, sat in a circle, for a quick round of emotional response to the session, normally in the form of one single sentence, making sure every person in the circle

is given the option of expressing themselves. The rule in such a circle is that people should not be allowed to comment on the emotional response of the others, and the facilitator should clarify that at the beginning.

Typically, the narrative ends up being couple of pages A4 long when transcribed, or one A0 written with felt tip pens, but this is only indicative and not prescriptive.

3.2.2 Block E – Identifying Indicators of Success

Activity 6: Finding indicators in the narrative

> **Time**: 1.5 hrs   **Responsible:** Group facilitators
>
> **Format**: Homogeneous stakeholder groups as for previous activity
>
> **Output**: A bullet point list of indicators, criteria or measures. Usually around 10 indicators will be listed.
>
> **Materials:** Narrative and recording (if made) from previous activity; Flipchart paper; Felt-tip pens
>
> **Summary**: Key aspects of the 'narrative of success' identified, and indicators developed to identify when each aspect had been achieved. Indicators should be SMART – **S**pecific, **M**easurable, **A**chievable (or **A**ttainable), **R**elevant and **T**imebound. Max 10 indicators per group. Note that discussion of indicators may lead to a revision of the 'narrative of success', as thinking in terms of indicators may reveal assumptions or overlooked aspects of the narrative.

Aim: The aim of the session is to identify ways of measuring whether the positive narrative we have developed in Activity 5 has been achieved or not, and of monitoring the progress towards the narrative. In other words, we are trying to answer the following questions:

- Has our plan for the future been successful or unsuccessful?
- Have we achieved what we set out to achieve?
- Have we gone in the right direction, and if so, how far have we gone and how much is still left to do?

Facilitation:

In preparation for the session, in the case where the narrative has been recorded on mobile phone or recorder, the facilitator will transcribe the narrative on a piece of flip chart paper as faithfully as possible.

As in the previous session, one person will facilitate and one person will record the outcomes. The outcomes are a bullet point list of indicators, which may also be explained as "criteria to measure", or "measure". These expressions are not exactly equivalent. However, the key point is that:

the group needs to identify a set of 'criteria' that allows them (and others) to understand whether they are progressing towards the 'vision for the future' that they have set out to achieve.

The facilitator will begin the meeting by asking for feedback on the previous session. S/he will explain the aim of the session, and accept a (quick!) round of feedback. To keep session time under control it is worth allowing people only a limited amount of time for feedback, or a limited amount of words, e.g. 'can you give us your feedback in less than three words'. The session proceeds by asking the group for a moment of quiet while the narrative agreed during the previous session is read out (or the recording is played) (only the narrative, not the discussion or the comments!).

In the case where the narrative has been recorded on a large sheet of paper, the facilitator will hang the sheet of paper in front of the group and will read the narrative aloud to the whole group. The sheet of paper with the narrative will be left in easy reach so that it can be referred to if needed – but not placed so that it will distract the attention of the group.

As in the previous session, the facilitator will use gentle steering towards indicators that are:

- stakeholder centric and expressed from the perspective of the stakeholder
- covering social, environmental and economic aspects of the narrative
- qualitative or quantitative.

To do so the facilitator will try to address questions *to the character* that was built in Activity 5 using a stakeholder centric perspective. For example, s/he will say "how does Tigest know she has achieved what she had planned?" and not "We now need to measure whether Tigest has achieved what she has planned". S/he

will invite the members of the group to use statements centred around the character. For example, the stakeholders will be reacting by using statements, for example "Tigest feels safer" or "Tigest has better food on the table". By using gentle questioning the facilitator will then try to ensure the group will express criteria which cover all social, environmental and economic aspects.

Criteria can be expressed either qualitatively or quantitatively. For example, a qualitative criteria might be "Tigest eats better food", evaluated on a scale "good to bad", while a quantitative criteria might be "Tigest eats better food", evaluated numerically in terms of calories, proteins and vitamin intake, but this is a decision that the stakeholders can understand and can make. We expect only some of the criteria will correspond to quantitative measures, and the facilitator should not force the stakeholders to identify quantitative measures. The important point is not to agree the scale (e.g. "good to bad") but rather to ensure that the indicator or criteria are able to be expressed in terms of a scale, and are therefore measurable.

The facilitator will then try to make sure every such statement is recorded, and will suggest that the group, where possible, try clustering criteria. For example, "Tigest has better food on the table" and "Tigest and her family are not hungry", may be grouped together. Keep into account that the clustering needs to be accepted by the group, and that when the group reject a clustering attempt, the group overrides the opinion of the facilitator. It is anticipated that around 10 indicators will emerge.

Activity 7: Ranking Indicators

Time: 1 hr   **Responsible:** Group facilitators

Format: Homogeneous stakeholder groups as for previous activity

Output: A list of 5 indicators

Materials: Pre-printed blank voting papers for each group member (a sheet of A4 with a two-column table with at least enough rows for one indicator to be written into each row). Alternative, if there is time, the voting papers can be printed with the indicators written in (ideally in local languages); Stickers or counters

Summary: This is a more dynamic session focused on a voting method to reduce the indicators from 10 indicators to the top 5. A paper ballot sheet will be provided for each person to cast 10 votes, distributed however they like between the 10 indicators based on their individual perception of the most significant or important indicators. Ideally the vote should be private and not visible to others, particularly in those cases where the power relationship within the group is asymmetric. Approximate timing: 15 mins explaining rules and purpose; 20 mins voting; 10 mins adding up votes; 15 mins discussion to close.

Aim: To enable group members to express their indicator preferences through voting, resulting in a shorter list of indicators that reflects the priorities of the group. This shortlist will be taken forward to the final session of the day, and shared with the rest of the workshop participants. In this way, the short list will represent the views of the stakeholder group, and this view will be expressed to others in the workshop.

Facilitation:

Prior to the session starting, the facilitators will need to write the indicators into the voting papers. There should be enough voting papers for each group member, and each paper should have all indicators listed with a space next to the indicator in which the group member can cast their vote. This voting paper may be pre-printed with the indicators prior to the session, or if facilities and time for printing are not available, blank sheets can be prepared in advance and the indicators written in by hand. Indicators should be written in local languages, and facilitators should be aware of (and support) any participants who will struggle to read the indicators.

The first 15 minutes of the session should be used to explain the aim of the session and voting rules. The rules are as follows:

- Each group member can distribute the same number of votes as there are indicators (so usually this will provide each group member with 10 votes, or if there are x indicators, they can cast up to x votes).
- The group members vote on their own, without discussing with any other members of the group.
- Votes can be distributed in any way. So, if one person believes that two of the indicators are equally important to them, but none of the others have any impact in their lives, they would give 5 votes to each of the two indicators that they see as important. Alternatively, they may distribute their votes more evenly.

It is essential for the facilitators to make clear the consequence of voting. For example:

- Each group member should vote according to their personal preference.
- They must recognise that if they do not vote for a particular indicator, they are saying that this indicator is not relevant to them, or not important to them.
- They may choose to give many votes to one indicator, reflecting the importance of that indicator to them (for example, they may think that "A healthy and sustainable herd of cattle" is really, really important, and give this 7 votes). The consequence is that they will have less votes (in this case 3) to distribute among the other indicators – meaning that there will be several indicators that they do not give a vote to.
- In other words, the voting is a balance between giving lots of votes to important indicators, and still being able to cast at least one vote to those indicators that have some importance to them.

Facilitators might suggest that each person starts by identifying those indicators that are not important to them, or have no meaning in their life. These can then be crossed off, helping them to see how many indicators they need to give at least one vote to. The most important of the remaining indicators will need to receive more than one vote.

Ideally, each group member will be given as many counters, stickers or discs as there are indicators, to represent their maximum number of votes, and simplify the distribution of their votes between each indicator.

Voting

After the rules have been clarified, the participants will then be given 20 minutes to distribute their votes. Facilitators should be on hand to clarify the process and talk through the consequences of different voting options (e.g., "you have given no votes to this indicator – are you happy that this means this indicator is not important to you?") if necessary. However, facilitators will have to be careful not to encourage or guide the participants towards voting or not voting for particular options.

At the end of voting the facilitator will write on the final score, as a number, on each person's voting sheet (in this way, the vote is recorded even if the stickers or counters are lost). Secrecy should be ensured, particularly in those cases where the power relationship within the group is asymmetric!

Results

The facilitators should make sure that everyone is happy with their choices after 20 minutes. After allowing 10 minutes for the facilitators to count up the votes, the final 15 minutes will be spent feeding back the results. The facilitators can write up the total votes for each indicator on a flip chart. The closing discussion should clarify which are considered to be the top 5 indicators for the group, i.e., those with the highest number of votes. Facilitators should make it clear that the absence of particular indicators does not mean that these are not important to some people; rather, it is that the group has expressed a preference for the top five as being more important to them as a whole. A tie between 5th and 6th placed indicators should be resolved through discussion.

The facilitator should ensure they have enough information to feedback on behalf of the group, in particular that they have:

- the list of indicators, the ranking, and a clear understanding of the meaning of those indicators; and
- Initial thoughts or ideas as to how the indicators should be measured, and the scale by which progress toward the vision can be monitored.

3.2.3 Block F - Sharing indicators of success

Activity 8: Reflection on indicators

Time: 1.5 hrs   **Responsible:** Group facilitators

Format: All stakeholders, together in a plenary session.

Output: Sharing of each group's shortlist of ranked indicators; notes on identifying which groups have similar priorities and where there are differences, exposing similarities and differences in perspectives; notes of any discussion that emerges from the stakeholders as to their views on these similarities and differences. The discussions may lead to some clustering of indicators, i.e. indicators grouped together around similar themes.

Materials: Post-it notes or similar, and a wall or several sheets of paper on which they can be stuck and moved around (to allow clustering). Ideally, a pack of different coloured post-it notes should be available for each group.

Summary: Each group will present their 5 indicators, with each indicator written up on a sticky 'post-it' note. These will be stuck on the wall and clustering take place by manually moving the 'post it' notes: 'post it' notes with similar or overlapping indicators will be moved close to each other. This process provides all stakeholders with a sense of areas of where their ambitions overlap or are mutually supportive, or (more problematically) where their ambitions are significantly different or incompatible

Facilitation:
This session will be facilitated by one of the workshop organisers, who is referred to as the 'plenary facilitator'. The facilitators from each group in the earlier sessions will be invited to present the findings of their group. Each group facilitator should explain the process that they went through, noting significant issues or discussions that arose during the production of the narrative. The focus, however, should be on presenting the short list of five indicators. The group facilitator should present each in turn (in random order), explaining what is meant and any reasons why their group felt this was a particularly significant aspect of their idealised future life. It is important at this stage that the audience is able to understand the meaning of the indicator, so time should be spent on this and the plenary facilitator should ensure that the audience has an opportunity to ask questions. At the end of each presentation, the plenary facilitator will attach post-it notes to the wall, with one note describing each indicator. The post-it notes belonging to each group should be clearly identifiable (e.g. through the use of different coloured notes for different groups, or if this is not possible, through a group number on each of the post-it notes).

Each group is anticipated to need around 20 minutes to feedback (including time for translation): for example, in the case of four groups, the process will last 1 hr 20 minutes. The plenary facilitator will have to keep an eye on time to ensure groups do not overrun, as this will prevent time being available for a final discussion.

The session will close with a discussion facilitated by the plenary facilitator, which may lead to the clustering of similar indicators. However, avoid driving toward clustering if only a few members of the group are contributing to the discussion. This clustering does not need to be definitive. The aim is to illustrate where there are broad similarities and differences between the groups. It is important that:

- the particular views of a group do not get subsumed within a cluster (i.e., be sure to emphasise subtler differences within each cluster), or
- that those groups with 'outlier' views (e.g., in a cluster of one) are not ignored or undervalued. Rather, the interpretation of this should be in terms of: "this group has an important perspective that up to now has not been appreciated by the other groups."

The day should end with a summary of what has been done, and what has been found in the final session. The plenary facilitator should emphasise that the purpose of identifying the similarities and the differences is to provide the starting point for the second workshop. This second workshop will bring together information on the environmental consequences of different future livestock scenarios, and the economic indicators. The differences and similarities will be explored again, in more detail in light of the environmental data, ultimately leading to a shared plan for the future.

4 Tool development - Initiating a site-specific CLEANED R tool

> **Time**: Several weeks   **Responsible:** Modeller(s)
>
> **Format**: Coding with consultation and cross-reference with local experts
>
> **Output**: CLEANED R tool and RShiny interface for the study site
>
> **Materials:** Context-specific data or expert estimate of parameter values

After the first workshop, the next activity is to use the information created in the first workshop to set up a CLEANED R tool that is specific to the study area. The first workshop collected data on the current livestock systems, how stakeholders see the livestock systems changing in the future, and what their socio-economic objectives and priorities are. The information on current livestock system characteristics is used to set the base run values for the CLEANED R tool. The information on future livestock system characteristics is used to define the option space that the CLEANED R tool needs to be able to simulate. The narratives and socio-economic objectives contribute to deciding on the selection of pre-set options to provide with the Transformation Game in the second workshop.

The CLEANED R tool is the ex-ante environmental impact assessment tool based on the CLEANED framework (Notenbaert et al., 2014) that takes the landscape as the unit of analysis (e.g. a district) rather than the farm. It is implemented in R code, and is based on open source data with expert input and validation. The CLEANED R tool is described in the accompanying document, "The CLEANED R tool: Generic Manual" (Pfeifer et al., 2019), with details of what variables and modules make up the tool.

The CLEANED R tool aims to be context-specific so that it is relevant to the local landscape and to the people using that landscape. As such, it is not an 'off-the-shelf' or 'plug-and-play' software that can be taken from one location and used in another without any adjustments being made. It needs to be set up with variables and data that describe the local context well enough to be useful, without requiring years of detailed experiments. There are three types of input variables required to set up a tool for the study area (see the Generic Manual for more details, (Pfeifer et al., 2019)):

1. the parameters to characterise *the livestock categories,* which are user-defined by information from the first workshop, from key informant interviews in the reconnaissance step, from local feed and livestock experts and from relevant literature;
2. a set of parameters that can be extracted from *geographical layers*; and
3. a set of parameters for which no geographical layers exist and therefore are *semi-manually defined*. Most of these parameters are manually entered into an excel sheet that is called upon in CLEANED R by some modules, including feed and fodder characteristics and parameters from the IUCN red list of endangered species.

The first task is to identify how to translate the four or so systems described by the groups in Workshop 1 into livestock categories in the tool. This is a balance of making a tool that reflects how the local stakeholders view and categorise the animals in their landscape while making categories that are mathematically distinct, i.e. that look different enough to the equations to warrant being in a separate category.

Then, the task is to identify relevant numbers or data for the parameters listed above that describe the current livestock systems, to create the base run. The base run is a representation of the present day situation, against which any changes arising from scenarios will be compared. The base run, and the data behind it, is verified with local feed and livestock experts to check that it looks credible.

Finally, choose and define a selection of pre-set options that offer plausible development options or pathways, based on Workshop 1 future livestock system descriptions, the narratives of success, other reconnaissance findings and expert input.

5   Workshop 2 The learning space

Time: Up to 6 days   **Responsible:** Project team

Format: Two day workshop + 2 day facilitator training (before) and 2 day report writing (after)

Output: A shared understanding of opportunities and constraints for development of livestock in the area

Materials: Workshop venue, workshop materials, 8 facilitators, participants

The first ResLeSS workshop gathered data from stakeholders in relation to the environment (to enable parameterisation of environmental impacts assessment tool CLEANED R) and economics (through capturing a wider understanding of value than finances alone). During this first workshop, the environment component (Day 1) helped to build relationships between participants. Up to this point, the environment component has been largely independent of the equity component (while the economics data gathering exercises have been fully integrated with the equity component from the outset). However, Workshop 1 commenced a step-wise process which builds towards full disciplinary integration and participatory appraisal of potential future changes in livestock-keeping (i.e., towards transdisciplinary research), with a central focus on the development of more equitable relationships between stakeholders.

Figure 4: Illustration of Workshop 2 bringing all aspects together for shared learning, for discussion with facilitators and participants

This transdisciplinary enquiry into livestock futures, via a participatory process that explores the relationship between economics, equity and the environment, is the focus of Workshop 2 (Figure 4). This will be a two-day event (balancing the need for sustained interaction with the realities of stakeholder time commitment) that builds on Workshop 1 through:

1. Use of CLEANED R to generate environmental impact data for different livestock scenarios, parameterised for the case study site in each country using the data gathered in Workshop 1
2. The assessment of potential livelihood impact of alternative livestock scenarios, using the socio-economic indicators developed during workshop 1.

5.1 Scenarios and vignettes

In the following,

- A **_livestock production practice_** describes a way of keeping livestock (e.g. livestock species - cattle or sheep, traditional or improved breeds - feed requirements, and management). In CLEANED R, each livestock production practice is parameterised via around 17 parameters (differences in land use for feed production, feed basket, animal productivity, manure management etc.).
- A **_vignette_**[7] is a narrative description of a particular livestock production practice (e.g. traditional cattle extensively grazed, or improved cattle tethered and fed with locally grown grasses). Vignettes are used to quickly formulate scenarios in a workshop. For each vignette all CLEANED R parameters are fixed, and by only selecting which vignettes to include and the proportion of each vignette, the participants can define a scenario (e.g. 10 % vignette A, 40% B, 50% C).
- A **_scenario_** refers to one possible mix of different livestock production practices in a defined landscape. This encompasses the types of livestock production practices assumed to be present and the proportion (or scale) of each practice. For a particular scenario, CLEANED R calculates the environmental impact from the mix of livestock production practices in a landscape.

5.2 Workshop Overview

The workshop is divided into two sections, with six activities spread over two days (Tables 3 & 4).

Day 1 prepares the stakeholders for playing the Transformation Game, by defining common socio-economic indicators and learning how to design scenarios for the Game. Day 2 will be spent playing the Game – iteratively evaluating and refining scenarios to understand what is desirable and what should be avoided when making changes to livestock production in the area. The overall aim of the second workshop is to support participants to undertake a shared evaluation of the social, economic and environmental consequences of plausible livestock futures.

Table 3: Guideline agenda for Day 1 of Workshop 2

DAY 1				
Time	**Activity**	**Led by/Format**	**Details**	**Materials**
30 min[a]	**Welcome & Introduction**	Workshop leader	Reminder of first workshop, objective of this second workshop, rules of engagement	
Block A: Economic indicators				
2 hours (with break)	**1) Refining economic indicators**	Group facilitators, 4 Stakeholder groups from Workshop 1	Facilitators support groups to define their top 5 indicators from Workshop 1 more clearly. The definition needs to be more specific, what exactly do they mean, and include an indication of how to measure progress, considering what actions might be needed to reach success.	Flipcharts with Indicator definition template, Marker pens
Break or lunch	_Summarising to common indicators_	_Workshop leader/ team (no participants)_	_Workshop leader gathers indicators from all groups, identifies common themes and makes a first draft of some common indicators to be revised in plenary_	_Flipcharts with template, Marker pens_
1 hour	**2) Defining common economic indicators**	Plenary and 4 Stakeholder groups from Workshop 1	In plenary, with input and feedback from the groups, the session facilitator identifies common indicators that represent the shared priorities of the workshop, ensuring that they also capture what is most important to each group. Negotiation must take place over the final meaning associated with clustered indicators.	Flipcharts with prepared common indicators

---

[7] In the CLEANED R interface, the vignettes are called _pre-set options_. Vignettes are a research method more commonly used to elicit and study responses to hypothetical situations to understand perspective (Lewis-Beck et al., 2004). More could be made of their current use as brief descriptions of the CLEANED R pre-set options to tap into their full potential.

			Block B: Transformation Game in homogeneous groups	
2.5 hours (with break)	**3a) Introduction to the Transformation Game**	Plenary introduction then 4 Stakeholder groups as before	Introduction to the livestock categories (vignettes) and demonstration of how to build scenarios, followed by group discussion to build a scenario that will contribute to achieving the common indicators. Facilitators record the reasoning and assumptions – why did they choose this scenario? What do they expect from it? Write on flipchart, 3 reasons why the group thinks the scenario will achieve their socio-economic goals.	Game board, vignettes, bricks, pen and paper, flipchart
40 min	**3b) Present group scenarios and closure**	Workshop leader, group representatives Plenary	Each group representative presents their scenario and why it is the best. Workshop leader introduces fun bean voting activity, reflect on the day and thanks. As participants disperse they vote.	4 large plastic jars, 4 types of beans
After end of day	*Preparing for day 2: result sheets, and mixed group starting scenarios*	*Workshop leader/ team (no participants)*	*Run each group's scenarios through CLEANED R and draw out the key results on a graph, ready to be evaluated in the first activity on Day 2.* *From the group scenarios, identify trends and identify or create one or two starting scenarios to provide to the mixed groups on Day 2. Provide the results graph with the starting scenario results already drawn in.* *Decide on how to split the participants into mixed groups – randomly or with some distinction*	*Flipchart paper, results sheet template, marker pens*

ᵃ Be prepared for delays in starting, or starting taking longer than 30 min. Also be prepared to be flexible with activities – for allowing them to run over time, or to make allowance for delayed food prepared by the venue, or other disruptions.

Table 4: Guideline agenda for Day 2 of Workshop 2

			DAY 2	
Time	**Activity**	**Led by/Format**	**Details**	**Materials**
0.5 hr	*Review of Day 1*	Workshop leader		
			Block C: Transformation Game in homogeneous groups	
1.5 hrs	**4) Introduction to the CLEANED R tool and its outputs**	Plenary introduction then 4 Stakeholder groups as before	The workshop leaderᵃ introduces what the CLEANED R tool is and does, and then explain what results it produces: i) productivity measures; and ii) environmental impact measures. In groups, the facilitators then lead the groups in evaluating the outputs of the scenarios they designed on Day 1, considering what is acceptable to them or not, both in terms of impacts on their 'good life indicators' and on the environment.	Game board, vignettes, bricks, results sheet, pen and paper
			Block D: Transformation Game in mixed groups	
short	*Split into new groups*	Workshop leader	Split the participants into their new mixed groups and explain the next activity, and new starting scenarios.	
2 hr	**5) Playing the Game – evaluating the starting scenario**	Group facilitatorsᵇ and **new mixed** groups	Group facilitators introduce again the activity and review the starting scenario to remind everyone of the scenario design, then lead the group through interpreting the results. Groups then identify what they can live with in the scenario results when evaluating them against the 'good life indicators' and environmental impact measures.	Game board, vignettes, bricks, results sheet, pen and paper

2 hr	**6) Playing the Game – revising the scenario**	Group facilitators Mixed groups from activity 5	Group members suggest what should change in the scenario, in order to address their concerns raised in Activity 5, revise the scenario accordingly and re-evaluate it. Then repeat this revision as often as time allows or until they are happy with the scenario. Facilitators record the reasoning and assumptions – what did they like/not like, what did they change, why did they change it? What do they expect from it? Are the results different than what they expect?	Game board, vignettes, bricks, results sheet, pen and paper
		Block E: Closure		
0.5 hr	Closing and post workshop questionnaire (if applicable)	Workshop leader Plenary	Reflect on the workshop,	

ª The workshop leader or designated team member.

ᵇ Depending on how many mixed groups there are, the eight facilitators will need to be re-assigned to the new mixed groups. There will need to be one who leads the discussion, one who operates CLEANED R and draws out the results and one to take notes and document the discussion. Any surplus facilitators can also take notes and document the discussion.

Distinctions between mixed groups could be based on gender, or on e.g. loud voices vs quiet voices. If facilitators are available, and the group numbers allow, it could be useful to make three mixed groups, but all mixed groups must have all four homogeneous stakeholder groups represented.
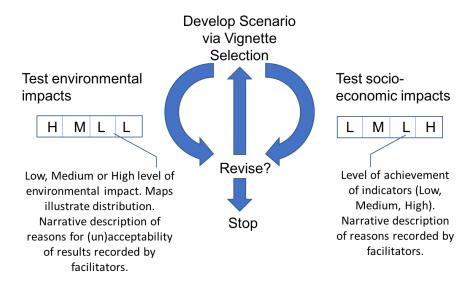
5.2.1 Overview of the Transformation Game

Figure 5: Iterative method for deriving a preferred livestock scenario.

Iterations continue until the group is satisfied with the outcome or until a fixed maximum number of iterations has been reached. A 'scorecard' for environmental and socio-economic indicators is recorded, alongside reasons given, for each iteration.

As illustrated in Figure 5, to establish a preferred scenario, the group iteratively refines their scenario as follows:

1. The group selects vignettes to build a scenario that they believe represents their best possible future (in terms of the socio-economic indicators agreed in the earlier plenary session).

a. The group identifies how many animals should be in each vignette, defining the distribution of a total number of animals between the production practices in use across the landscape, considering how best to contribute to the socio-economic indicators.

2. The group assesses the scenario according to the socio-economic indicators, using a socio-economic score-card to record how and why the group chose their vignettes and animal numbers
   a. To what extent (marking progress as Low, Medium or High) do they expect the scenario to help them make progress towards their socio-economic indicators? And why do they expect this?
      i. It is perfectly ok to say that an indicator has nothing to do with livestock and therefore will not be affected. If there is time, consider what *would* contribute to achieving that indicator?
   b. The facilitators enter the scenario into CLEANED R – choosing a memorable scenario name

3. CLEANED R generates environmental impacts for the selected scenario. The group evaluates the outputs with an environmental score-card, recording reasons for the score.
   a. The facilitators encourage the group to reflect on the impact measures using their knowledge of the area, thinking of availability and access of resources, and competing users, and give a local 'expert' evaluation of the impact as desirable, acceptable or unacceptable
      i. Different evaluations offered by different members of the group should be recorded. But, facilitators should support the group to discuss and negotiate until there is a shared evaluation - and record the trade-offs agreed reaching this consensus.

4. The group discusses whether they can/ should make any changes to the scenario, if any of the impacts are undesirable or unexpected. If required, the group modifies the selection of vignettes and amount of animals with the aim of improving the trade-off between environmental outcomes and perceived socio-economic benefit.

5. Repeat steps 2 - 4 until the group is satisfied with the outcome, or until they run out of time.

For each scenario iteration, facilitators record the environmental and socio-economic impact 'scorecards' with the narrative description of the reasons given for the scores. Facilitators also save the CLEANED R outputs, labelled [Scenario name] 1, 2, 3 etc. This will allow tracing of changing judgements and assessment of trade-offs (in particular, between environmental and socio-economic impacts) made by the group during each iteration.

5.3   Day 1 Refining indicators and learning the Game

5.3.1   Welcome and introduction

Time: 0.5hrs

A formal welcome will be followed by two slides to remind participants of the progress made and the direction of travel for this workshop.

- Many thanks for coming and to the host in particular for hosting us today
- These workshops are a place where we are looking to understand what might happen in the future to livestock and the livelihoods that depend on them – so for this we need to take into consideration the views and knowledge of the farmers, but importantly also the policy makers, community leaders and those who have the capacity to influence change that could generate positive outcomes for those connected to livestock
- This will mean that we are able to bring together all those with responsibility for meeting the huge challenge of feeding ourselves, the nation of xxx and the region today and into the future, in 2030

Introduction

- A brief review:
  o Project aims and objectives
  o Summary of last workshop: what we did, what we achieved, what we did since then, and the results that we want to use to start Workshop 2 with.
  o What we learnt – the different ways in which livestock are managed and understood in the study area – and how diverse this is in this region.
- Workshop outline

- What we are trying to achieve:
  - A vision of what is to be desired and what is to be avoided in future livestock based livelihoods in the region.
  - We hope that this will generate a better understanding among all stakeholders.

Rules of engagement: Setting the rules of the space

- When you're in this space you are "Explorers of the future" (or a similar local idiom)
- This means:
  - We all contribute because we all have a different "view" of the future
  - No question is foolish – if you are unclear feel free to ask
  - If you have comments, all opinions are valuable
  - No threats are allowed; only respectful discussion of different views
  - Please do not express views on other people or on other people's opinions
- Translation will be provided where necessary; main language is [local language]
- Cellphones on vibrate, please answer calls outside the explorer's space

5.3.2 Block A - Economic Indicators

This section of the workshop aims to define a set of shared socio-economic indicators that reflect the most important priorities of all stakeholder groups, to be used when evaluating potential scenarios.

Activity 1: Refining economic indicators

Time: 2hrs   **Responsible:** Group facilitators

Format: Homogeneous stakeholder groups. Stakeholder groups are the same as in Workshop 1.

Output: Maximum 5 ranked, specific, measurable indicators including a narrative description of low, medium and high progress in the case-study context.

Materials: Each group's indicators and narrative from Workshop 1; flipchart paper and pens; reporting sheets for defining the indicators.

Summary: Workshop 1 defined and ranked socio-economic indicators for each stakeholder group. However, it is likely that these indicators need closer definition to avoid ambiguity (apparently similar indicators may have different meanings for different groups) and to allow for progress to be measured against the indicator. Indicators should be SMART – **S**pecific, **M**easurable, **A**chievable (or **A**ttainable), **R**elevant and **T**imebound – and may be quantitative or qualitative.   In this opening session of Workshop 2, facilitators re-introduce the indicators and will work with the groups to produce a refined set of indicators, with ranking and the ability to measure progress against each indicator.

Facilitation: Start with the whole room present. Before splitting into groups, introduce the exercise and the desired output. (5 min)

The room is then split into the same stakeholder groups as used in Workshop 1. Within each group, the group facilitator works with the participants to refine each indicator, as follows:

1. Repeat the objective of the exercise – to precisely describe, refine and measure the indicators from Workshop 1. In order for the indicators to be useful for monitoring progress towards the group's vision of the future, they need to be ***measurable***. Consider the SMART framework for defining indicators – **S**pecific, **M**easurable, **A**chievable (or **A**ttainable), **R**elevant and **T**imebound.
2. If the expression "indicator" is difficult for the stakeholder to comprehend, then it may be useful to try to use different expressions, for example "criteria to measure", or "measures". These expressions are not exactly equivalent. However, the key point is that: *the group needs to identify a set of 'criteria' that allows them (and others) to understand whether they are progressing towards what they have set out to achieve (the 'vision for the future' that they have set out to achieve).*
3. Criteria can be expressed either qualitatively or quantitatively. For example, a qualitative criteria might be "Tigest eats better food", evaluated on a scale "good to bad", while a quantitative criteria might be "Tigest eats better food", evaluated numerically in terms of calories, proteins and vitamin intake, but this is a decision that the stakeholders can understand and can make. We expect only some of the criteria will correspond to quantitative measures, and the facilitator should not force the stakeholders to identify quantitative measures. The important point is not to agree the scale (e.g. "good to bad") but rather to ensure that the indicators or criteria are able to be expressed in terms of a scale, and are therefore measurable.
4. Read out the narrative and present the top five indicators voted for by the group in Workshop 1. Establish whether everyone in the group still agrees with those five.
   o If there is disagreement this should be resolved by allowing the dissenting view to be aired, and establishing if the rest of the group agrees.
   o If there is agreement that there is a problem with the list, then the group must decide on an alternative – *however*, this can only take a maximum of 5 minutes, as there is not time to re-run the negotiation undertaken in Workshop 1. If the discussion does not reach a conclusion, then the process should be recorded by the note taker and after the allotted time the group must move on.

- o The facilitator should have the long list of indicators from Workshop 1 available to aid this discussion, if necessary. (10 min).

5. Introduce the reporting sheet (below) that they can use as a guide to fulfilling the objective, and start discussing the first indicator to refine it to be more specific and measurable.
   - o ***Start with the highest ranked indicator*** (the most important indicator)
   - o ***Remember: only 15 min per indicator***.
   - o Explain that low/medium/high is a way of setting points on the quantitative or qualitative scale agreed for measuring the indicator/criteria; it is a way of thinking about the pathway to getting to the goal of the indicator, where low and medium are steps along the way, and high is close to reaching the goal. So the task for the group is to think:
     - ▪ What is the objective or goal of the indicator?
     - ▪ What is needed to get to the goal?
     - ▪ What does one need to do to get closer to reaching the goal?

Indicator:		
Description:		
Steps needed:		
Low:	Medium:	High:

- o The process of establishing low/medium/high should help define the indicator with greater precision. This exercise is therefore iterative – the description of the indicator and the measures (low/med/high) are refined together.
- o While some indicators may be expressed in terms of individuals, try to encourage thinking in terms of what will need to change within the community.
- o If there are additional steps or conditions that need to be met in order to make progress toward the indicator/criteria, note these in the 'Description' box under 'Steps needed'. In some cases, this has been interpreted as 'Enabling conditions'.

6. For quantitative/ measurable indicators, try to give an estimate of thresholds / values that show when you have reached low or medium progress, or come close to achieving the goal (high progress).
7. For qualitative indicators, give a narrative description of what low, medium and high progress look like.
8. When describing the indicator, try to be as specific as possible – keep asking for details, for example, if the indicator is 'improved technology', then ask 'what technology do they mean?', 'what do they mean by 'improved'?', 'who should have this improved technology?'.
9. Some good neutral questions for drawing out detail:
   - o Can you say more about that? What do you mean by xxx? What matters to you about that? How so? What else can you tell me about [this issue]? Tell me more. Can you give me an example? What's your thinking about that?

The exercise closes when one reporting sheet has been completed for each agreed indicator (or once at least three are done – remember they should only spend 2 hours on this process, as additional time spent on it will consume the time available for sessions later in the day).

Activity 2: Defining common socio-economic indicators (KPIs)

Time: 1 hr

Format: Plenary, but sitting in the stakeholder groups from Activity 1.

Output: Maximum 5[8] Key Performance Indicators (KPIs) agreed as the shared priority for the workshop. Increase in understanding between those in different stakeholder groups of the differences in socio-economic priorities.

Materials: Reporting sheets with 5 indicators per group from first activity; flipchart paper to record new KPIs definitions and progress measures; (at the end of the session) a final set of indicator sheets to photocopy for use in the rest of the meeting.

Summary: Each group and their facilitators will come into the plenary ready to present their refined indicators. A discussion will be facilitated which leads to the clustering of similar indicators and their measures. The aim is to illustrate where there are broad similarities and differences between the groups. It is important that, as far as possible, (a) the particular views of a group do not get subsumed within a cluster (i.e., be sure to emphasise subtler differences within each cluster), and (b) that those groups with 'outlier' views (e.g., in a cluster of one) are not ignored or undervalued. It might be expected that (at least) the top ranked indicator for each group is represented in the final list, although this cannot be guaranteed. Negotiation must take place over the final meaning associated with indicators that have been clustered due to their similarity.

Facilitation: So far as possible, the session should be run in plenary but with each stakeholder group sat together (enabling them to provide a shared input into the discussion, helping to overcome issues raised by multiple languages, and empowering rather than isolating individuals). The aim is also to build agreement between groups.

The following procedure is to be followed:

1. The facilitator that has worked with each group sits with that group for the plenary. However, they should *not* speak for the group. Rather, their role is to encourage views from within the group to be aired in the plenary.
2. The session facilitator will undertake the initial grouping, guided by input from the plenary, ensuring that each group has an input into the grouping discussion.
3. Once an initial grouping has taken place, each group facilitator spends 5 minutes with their group to establish whether they are happy with or have comments on the grouping by discussing the questions:
   i. Could the group live with the indicator list, even if it is not perfect?
   ii. If yes, identify one or (max) two key changes that would improve the list.
   iii. If no, identify key changes that would enable them to live with the indicator list, even if not ideal.
4. Each group reports their thoughts and the session facilitator works to make adjustments as required.
5. If there are more than 5 groupings and no resolution can be agreed, then a list of more than 5 indicators is the final output of the session.
   i. *This may be critical to ensure indicators that are particularly important to only one group are still included in the final list.*
6. Once the grouping has been agreed, the session facilitator repeats steps 2-4, this time focusing on the indicator definition reporting sheet for the combined indicator. It may be that groupings need to be split where there are unresolvable, mutually exclusive definitions, or conflicts in understanding or measuring. More than one iteration of 2-4 may be required to ensure all views are captured.
   i. If in special circumstances for causes of *force majeure* the workshop is running out of time, this step can be transformed into a session where the facilitator assembles the thresholds from the indicators making up the grouped indicator. Yet, this should be avoided if possible, because it means that the resulting indicator definition will not be fully participant-created.

---

[8] Five is suggested as a somewhat arbitrary maximum, because having more will increase the number of variables to be evaluating against. However, if the indicators from the groups are so diverse it may be hard to condense. A good guideline is to ensure that each group has at least one of their indicators represented; it is unlikely that there will be 20 unique indicators, but in Burkina Faso we had 6.

5.3.3 Block B – Transformation Game in homogeneous groups

The rest of the workshop looks to develop a shared livestock scenario that all participants agree satisfy the shared economic indicators. First, Blocks B and C introduce the Transformation Game to the participants while still in their homogeneous stakeholder groups. In Block D, participants are mixed up to develop and assess alternative scenarios to balance economic and environmental outcomes with input from all stakeholder groups.

Activity 3: Introduction to the Transformation Game

3a) Plenary – Introduction to scenarios and vignettes

Time: 0.5 hrs

Format: Plenary, but sitting in the stakeholder groups from Activity 1.

Output: Stakeholders introduced to CLEANED R pre-set options and designing scenarios.

Materials: vignette cards, game board and 'Lego' counters; copy of the final agreed set of KPIs from Activity 2 and criteria for what is High/Medium/Low.

Summary: This session will introduce the CLEANED R vignettes that lead to scenarios. As an important first step, participants will have a chance to discuss the livestock production categories that emerged from Workshop 1.

Facilitation: In plenary, but sitting in stakeholder groups, this session starts with a reminder of the output of Workshop 1 (current and future systems) and what has been done with the output:

- the livestock categories - what this means, and how to translate it into what people recognise from the real world.
- our interpretation of how the participants see those livestock keeping categories changing in the future – the pathways of transformation, represented by the vignettes
- the concept of vignettes and how these build to form scenarios, as ways of exploring possible futures.

Give participants an opportunity to confirm whether they have understood the vignettes.

Next, introduce the Vignette Board. The specific format will vary depending on context, but each group will have in front of them something like:

- 9 vignette cards representing (a) the current version of each livestock category (3 cards) and (b) 1 or 2 alternatives for how it might change in the future (6 cards)
- Also included may be land use vignettes, allowing the group to decide on the limits or rules defining potential future land use change.
- A Vignette Board which you will use to design your scenario
- Lego-type bricks that you will use to show how many animals are involved in each vignette across the 'landscape'

The session facilitator invites each group to sets up their Vignette Board with the current – 'baseline' – scenario. This shows:

- Each current livestock category with bricks assigned to represent the number of animals (using the example of Bama, Burkina Faso):
  - Agro-pastoral non-diary: 12 bricks representing 120 troupeaux
  - Agro-pastoral dairy: 23 bricks representing 230 troupeaux
  - Improved diary: 5 bricks representing 500 animals
  - Fattening: 55 bricks representing 55,000 animals
  - Draft: 22 bricks representing 22,000 animals
- A future scenario is a combination of vignettes with a number of animals assigned to each vignette.
- There are one or two vignette cards representing possible future production practices for each category. The current version of production can be used, if no change in practice is foreseen.

- Also included may be a land use category, allowing the group to set limits or rules defining potential future land use change.

It is only possible to choose one future option for each livestock category. Note that:

- the total number of animals in the landscape will most likely change in the future as a result of this shift in production practice.

Note also that:

- the future option for a household might be to change from one category to another;
- that it is possible for one household to be in two or more categories at once.

Figure 6 gives an example from Ethiopia, illustrating that the combination of different production practices that make up the livestock scenario for the landscape is defined by the distribution of the number of animals between the vignette cards (achieved using the bricks). The use of bricks allows a tower to be built on each card, providing a physical representation of the relative number of livestock assigned to each vignette.

- Note that, for ease of use, only a whole number of bricks can be added or taken away from each livestock category.
  - So if the baseline represents 100 animals with 10 bricks, the future scenario can be multiples of 10 animals (e.g. 150 animals represented by 15 bricks, or 140 animals represented by 14 bricks).
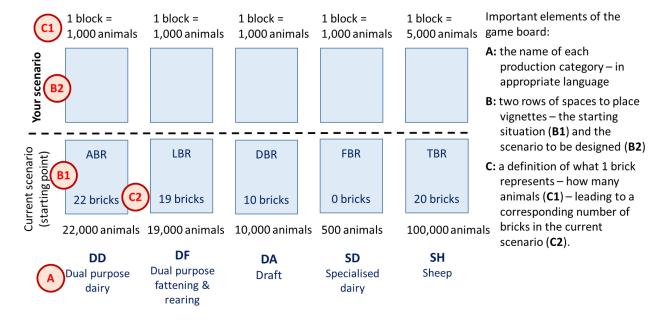- The group can also select the land use rules for their scenario.

Figure 6: Game board for participatory scenario development from pre-defined vignettes. Example from Atsbi, Ethiopia.

*During the game, vignettes are laid in the squares (row **B2**) and bricks piled on each vignette commensurate with the number of animals to be represented.*

3b) In stakeholder groups – designing a scenario to satisfy the KPIs

Time: 2 hrs

Format: Stakeholder groups from Activity 1.

Output: Appreciation of how scenarios translate into socio-economic impacts. Development of a shared scenario that would contribute to satisfying the KPIs. Shared understandings developed between stakeholders from different groups.

Materials: vignette cards, board and 'Lego' counters; copy of the final agreed set of KPIs and criteria for what is High/Medium/Low.

Summary: Working in their stakeholder groups, participants will identify how a combination of vignettes (cards with a narrative description of a livestock production practice on one side, and the associated CLEANED R parameters on the reverse) satisfies the KPIs, while being explicit about the assumptions that link the distribution of animals to the desired outcome. Facilitators will work with their groups to present their findings to the plenary.

Facilitation: The session facilitator introduces the group-work and the expected outputs.

Then, in groups, the group facilitators first have a look again at each vignette and check that everyone understands/ has the same idea about what it means.

Remind participants that it is only possible to choose one option for each livestock category.

So the question the group is being asked is: *in the future, in a world where the 'narrative of success' has been achieved, what will most people be doing in each livestock category? Why?*

In this activity, stakeholders will be supported by facilitators in their groups, to:

- Develop a scenario that they believe will fulfil (or contribute to) the KPIs. Starting from the baseline scenario and using the 'Lego' blocks:
  1. **For each vignette, decide how many animals will be present** (includes a don't mind option – not all vignettes have to be part of their scenario)
  2. **Describe how this combination of animals produces the desired outcome**

The second point – how this combination of animals produces the desired outcome – will require time to discuss and understand, and may lead to revisions of the scenario. This needs to be as detailed as possible, providing a full set of reasons how the scenario will fulfil the KPIs. For example, who owns the cattle in each vignette, where is the produce being sold, how does this income fulfil the indicators?

Additional factors to think about in this description:

- What assumptions are made in linking scenarios to impact? (e.g. that improved income leads to improved schooling through ability to pay school fees);
- It is entirely possible that stakeholders will judge that some indicators will not be altered by the scenario. This is of interest, as it indicates that other interventions – outside of livestock livelihoods – may be required for the aspirations expressed in those indicators to be met. If so, what additional actions – beyond changes to livestock practices alone – may be necessary for the scenario to also yield positive socio-economic impacts;
- whether the participants feel that some other stakeholder groups within the commune/community will do significantly better or worse in relation to each indicator.

Remember some good neutral questions for drawing out detail:

- Can you say more about that? What do you mean by xxx? What matters to you about that? How so? What else can you tell me about xxx? Tell me more. Can you give me an example? What's your thinking about that?

Facilitators record the reasoning that links the scenarios to the socio-economic indicators, for example in a form like the following. Note that the form should not drive the discussion – rather, the facilitator should stimulate a full discussion of issues but with a clear sense of what it is that needs to be clarified. The form should only be used if it is helpful to the facilitator:

KPI	How does the scenario address this?	Why? What assumptions, rationale?
Indicator 1		
Indicator 2		
…		

Closing of Workshop Day 1

The plenary facilitator should close with a clear statement of the next steps, so that participants are clear as to where the workshop is heading, and why. For example:

"We will go now and look at these [four] group scenarios and create [two] that represent or are inspired by these four. Tomorrow we will work in [two] mixed stakeholder groups, where you will have a chance to assess and refine one of these starting scenarios."

You will be able to discuss ways to improve the socio-economic outcomes – but as a group that includes the voices of all stakeholders. You will then get to explore the environmental consequences of your scenario, and refine the scenario to get the best balance of socio-economic and environmental outcomes.

Remember, in this task there will be representatives of all stakeholders in each group, ensuring that you move forward with everyone's interests being met.

Documentation:

Record on vignette board: which vignettes were chosen, and number of bricks

Record reasoning and assumptions, e.g. on separate KPI reporting sheet: Why did the group choose that combination of vignettes and number of animals in each? What do they expect the scenario to achieve (in terms of contributing to the KPIs)?

5.4   Day 2 – Playing the Transformation Game

In plenary, start with a short recap of the previous day's work – refining and agreeing KPIs, designing a livestock scenario to satisfy those indicators. Give an overview of Day 2 activities - Day 2 starts with homogeneous stakeholder groups and an introduction to the CLEANED R tool and its results. Participants learn how to interpret, discuss and evaluate the results with the scenarios they produced at the end of Day 1 (Activity 4). Then, participants are split into e.g. two large mixed groups with new scenarios, to play the Transformation Game. This is an iterative process, where the participants will run CLEANED R and evaluate against the environmental impact measures and the common socio-economic indicators (Activity 5), then decide if there is something they cannot live with, revise the scenario to address those, run CLEANED R, evaluate the results - and repeat the process until they are happy with the outcome, or run out of time (Activity 6).

The three sessions support groups to develop and assess alternative scenarios, through their subjective judgement of socio-economic impact (as low/medium/high score against the agreed indicators) and environmental impact (their interpretation of how CLEANED R's quantitative soil, water, biodiversity and carbon emissions outputs will translate into impacts in their area, and whether these impacts are acceptable or unacceptable) for a given scenario.

5.4.1 Block C – Transformation Game in homogeneous groups contd.

Activity 4: Introduction to the CLEANED R tool and its outputs

Time: 2hr

Format: Plenary, but sitting in their four homogeneous stakeholder groups

Output: Participants have an understanding of what CLEANED R does, and each group explores and evaluates the environmental and socio-economic impacts of their scenario.

Materials: Results graph drawn out on flipchart; flipchart for making evaluations; vignette cards; game board; 'lego' blocks.

Summary: The session introduces the CLEANED R environmental impact assessment tool, what information it produces and how to use those results, as they are only a representation of reality. Groups then critically evaluate what the results mean for them, and whether the anticipated environmental impact is acceptable or not (and why), given their wider knowledge of, for example, access and availability of resources and competing uses, and in relation to the common socio-economic indicators.

Facilitation: This session has the session facilitator introducing CLEANED R in plenary, and how to read and evaluate the results, and evolves into the group-work to evaluate each scenario.

1. Introduce CLEANED R:
   a. what is it? what does it do? It is only a representation of reality, to stimulate discussion
   b. how does it represent livestock keeping in [study area] – reminder of the production categories and pathways of transformation from previous activity
2. Highlight what the results can and cannot say, and how to use them:
   a. the number is NOT accurate, it is only an indication of the direction (and magnitude) of change when comparing to the baseline;
   b. the results show relative change from today, e.g. Scenario A requires 20% more feed than today which will need 15% more water than today. From this, participants with a broader understanding of the local context can discuss whether there is 15% more water available, how to access it, perhaps only a few could do so – whether it is feasible (i.e. acceptable) or not
3. Now, the session facilitator introduces how to read and interpret the output of CLEANED R using a scenario to explain some key dynamics giving rise to those results.
   a. There are two types of output: productivity measures and environmental measures.
   b. Tables give average impact measures for the whole study area, as the relative change in the impact for a scenario from the baseline (i.e. a representation of today's situation) as a percentage. The numbers for selected variables are drawn out onto a graph on flipchart in the workshop, to support discussion without overwhelming participants with information (Figure 7).

4. Give groups 10-20 minutes to react to and discuss the productivity results for their scenario:
    a. Productivity measures (% change from baseline) include: e.g. crop and grazing area used, amount of milk and meat produced, number of animals, and whether imports are required.
    b. Do the results meet their expectations when designing the scenario on Day 1 of how the scenario would contribute to KPIs? Why (or why not?)?
5. Show the environmental measures - for each pathway, there is a table showing the difference in key impact/ productivity measures (e.g. litres of water used per kg milk or meat produced, or tonnes of CO_2 equivalent per kg milk produced) between the scenario and the baseline
    a. (note to facilitators: for each pathway, there are also 1-3 maps of the calculated impact of the scenario but these are not shown to the group as they are complicated to understand and hard to view on a laptop screen in a large group)
    b. As a guideline, if participants cannot identify with the impact measure, ask the participants to think about how the current situation is with regard to that impact measure (e.g. water availability) and then think about what it would mean if it changed as much as the CLEANED R results suggest (e.g. that you need x% more (or less) water for growing livestock feed). Would this change be possible?
6. Now set groups to work on making their environmental evaluation of the scenarios – what impact does each result imply in the study area? What will be affected by the change in the productivity or environmental measure, and how? Is the impact desirable, acceptable or unacceptable **and why?**
    a. Facilitators check that everyone understands the task.
    b. If the group did not finish discussing the productivity measures before, this is the opportunity to continue, and fill in the productivity scorecard
    c. Facilitators encourage the group to reflect on the impact (% change compared to today) using their knowledge of the area, thinking of what the impact means in terms of availability and access of resources, variability in access or availability of resources and competing users, and give a local 'expert' evaluation of whether this impact is desirable, acceptable or unacceptable
    d. Facilitators should take note of the discussion, using suitable prompts to explore reasons – why did you give it that score? What is the rationale for that score?
    e. There may well be different evaluations offered by different members of the group – this is valuable for facilitators to record. But, facilitators should support the group to discuss and negotiate until there is a shared evaluation, and record the trade-offs agreed reaching this consensus.
7. When considering these results, also refer back to the socio-economic indicators to consider what socio-economic impacts the scenario might have (see Activity 5 as well). Consider: costs and benefits of the scenario; distribution of those costs and benefits across the landscape and population; and assumptions the group is making in linking the scenario results to the socio-economic impacts or costs and benefits. And are there links between the reasoning given for rating the productivity and environmental measures and the discussion of socio-economic impacts?

Context-specific example:

The group's evaluation can be captured as free-form notes on flipchart, or more systematically in scorecards such as Tables 5-7, or by more creative techniques, and what works best for the participants will vary. The challenge we found with the below score-cards is that it can become tedious quite quickly, if you plod through box by box, rather than, for example, the note-taking facilitator annotating from a more lively discussion and perhaps summarising to check that the participants agree with the notes s/he took. The trade-off, and challenge to the group facilitator, is covering all impacts while keeping the conversation dynamic and lively. Remember, the tool and these activities are meant to provide a (structured) stimulus for informed discussion.

In each location, different result variables may be considered important. Select variables that will be important or understandable to stakeholders, that will provide useful information to support their evaluation of the scenario. In our project, for example, manure was added as an output in Tanzania after participants showed special interest in know the volume of manure produced, not just the impact of manure on the soil balance (although they are highly correlated). An indicator of food security was added by the researchers to stimulate discussion about whether there is a trade-off between feed for animals and food for families, and whether this is might affect food security. In Ethiopia, volume of concentrates and planted fodder were added to get some measure of the costs of the scenarios – meat and milk yield give an indication of the benefits, but no indication of costs to ones pockets, only to the environment.
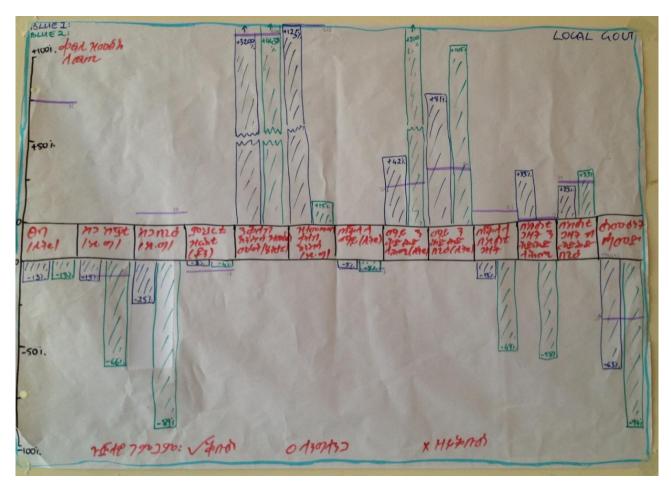
Figure 7: CLEANED R results graph, showing selected production and environmental result variables, an example from Activity 4 in Ethiopia

Key features of the results graph: The y axis is % change compared to the baseline (positive and negative change); the variable names are in the local language; each bar represents one scenario, so in this example they tried two scenarios – when drawing the first bar on a blank graph, remember to leave space for the next scenarios that might be tested; write a key at the top which identifies the scenario related to each bar, and lists the vignettes and number of animals chosen that defines that scenario; the purple lines across the bars in each variable represent the average across all group scenarios – this would not be available for Activity 5 and 6.

Table 5: Productivity scorecard template

Productivity Scorecard - Scenario Name and choice of vignettes and animals			
Productivity measures[a]	**% change**	**Group assessment** (Desirable, Acceptable, Unacceptable)	**Reasons for Group Assessment[b]**
Meat produced (1000kg)			
Milk produced (1000kg)			
Cropland used (ha=2.5acre)*			
Grazing land used (ha=2.5acre)*			
Rice area used (ha=2.5acre)*			

[a] Adjust productivity measures to reflect the study area tool and your choice of key measures to present and discuss

[a] This section is left as open space so as not to constrain participants to filling in each row. For example, the reason for the group assessment might be the same across several impact measures

Table 6: Environmental scorecard template

Environmental measures[a]		% change	Group assessment (Desirable, Acceptable, Unacceptable)	Reasons for Group Assessment
Water	Total			
Water	Per animal			
Greenhouse gases	Total			
Greenhouse gases	Per animal			
Nitrogen balance				

[a] Adjust productivity measures to reflect the study area tool and your choice of key measures to present and discuss

Table 7: Socio-economic scorecard template

Indicator:	Score[a] (L/M/H)	Why? (costs, benefits, distribution, assumptions)	Revision? After seeing productivity results?[b]
Indicator 1			
Indicator 2			
…			

[a] This score is an evaluation by the group of what progress they think will be made toward the socio-economic indicator given the scenario in question.

[b] If the socio-economic impacts of a scenario are anticipated before running CLEANED R, this column can be useful for updating or revising the group's evaluation once they have seen the CLEANED R results

5.4.2 Block D – Transformation Game in mixed groups

Activity 5: Playing the Game – evaluating the starting scenario

Time: 1hr

Format: New mixed stakeholder groups, which include members of all homogeneous stakeholder groups

Output: Each group understands their scenario and the expectations that they have from that scenario of the costs and benefits associated with it, and therefore potential socio-economic impacts.

Materials: Individual group laptops; results graph; KPIs; socio-economic and environmental score-cards (if using); vignette cards; game board; 'lego' blocks; pens.

Summary: The session will build on the use of the 'vignette cards' to make scenarios, introduced in Activity 3 on Day 1. Groups will discuss what the new scenario means in terms of what progress they would expect to make toward their socio-economic indicators with this scenario. Based on the discussion, groups will rate the scenario for each indicator, recording the reasons for their evaluations. In doing so, they will establish an understanding of the potential socio-economic impact of the scenario.

Facilitation: This session is in mixed groups to explore livestock futures with other stakeholders. Facilitators will need to ensure that there is representation and voice for all stakeholders.

First, the session facilitator introduces the two scenarios that the groups will be starting with, how they arose, and how to evaluate them against the socio-economic indicators.

In groups, the group facilitator repeats the task and checks that everyone understands.

- Consider the scenario and think about what it means – perhaps give everyone a minute or two to individually think back to yesterday's scenario made in their groups and compare it – how is it different? Would it still achieve what you expected when you were designing the scenario to meet your socio-economic indicators?

Then, as a group, consider the common socio-economic indicators agreed in the earlier plenary session, referring to the indicator definition sheets (and low/med/high thresholds in particular), and discuss how this new scenario might contribute to achieving the indicators:

1. To what extent the group think the vignettes and animal numbers in the scenario will help them make progress towards the socio-economic indicators (as Low, Medium or High progress).
2. And why do they think this?
   a. It is perfectly ok to say that an indicator has nothing to do with livestock and therefore won't be affected. If there is time, facilitators also then ask what *would* contribute to achieving that indicator?
   b. Facilitators need to focus on drawing out:
      i. how scenarios distribute socio-economic costs and benefits differently, as defined by the indicators. This will require reflection on the expected results and the reasons why each scenario yields different scores against the indicators;
      ii. whether the participants feel that some groups within the district/community will do significantly better or worse in relation to each indicator (i.e., that group would score differently in relation to the particular indicator);
      iii. assumptions made in linking scenarios to outcomes (e.g. that improved income leads to improved schooling through ability to pay school fees);
      iv. it is entirely possible that stakeholders will judge that some indicators will not be altered by the scenario. This is of interest, as it indicates that other interventions – outside of livestock livelihoods – may be required for the aspirations expressed in those indicators to be met.

The facilitators can use the socio-economic score-card (Table 7) to record the discussion, or some other form of documenting the discussion that will work for the context.

Then, as a group, consider the productivity and environmental measures for this scenario, as you did in Activity 4.

Activity 6: Revising scenarios

> **Time**: 2hr
>
> **Format**: Mixed stakeholder groups
>
> **Output**: Each group arrives at their preferred scenario through exploration of trade-offs between environmental and socio-economic impacts.
>
> **Materials:** Individual group laptops; result graphs; socio-economic and environmental score-cards; vignette cards; game board; 'lego' blocks; pens.
>
> **Summary:** The session supports groups to develop and assess alternative scenarios, through their subjective judgement of environmental impact (their interpretation of CLEANED R's quantitative soil, water, biodiversity and carbon emissions output, as acceptable or unacceptable impacts) and socio-economic impact (as low/medium/high score against the agreed indicators) for a given scenario.
>
> Groups will iteratively refine the scenario evaluated in the previous two activities by making a selection of vignette cards, defining how much livestock will be in each, assessing the impact of that selection and revising until they are happy with the output, or run out of time.

Facilitation: Remain in mixed groups. The rest of the day is available to alter the scenario, then re-test it, and repeat as often as time allows. At the end of the day, groups will come together briefly to present what has been learnt about the dependency between environmental, economic and equity considerations for future livestock livelihoods.

1. Invite the group to discuss the findings from the morning. Are they satisfied with the scenario? Does it adequately fulfil the socio-economic indicators? Are the environmental consequences feasible?
    a. What can they live with and what can you not live with?
    b. Are there changes that they would like to make?
    c. Facilitators try to draw out the reasoning and assumptions underpinning the changes they want to make – are they trading in an environmental impact for a socio-economic benefit, or vice versa? Are they trying to take advantage of benefits from both? These will be implicit – ask questions like, why do you suggest that? What is the rationale for that? What purpose or priority does it work for?
2. If there are changes to be made, the facilitator must ensure that all participants are happy – or at least able to live with – the changes being made.
3. Evaluate against the socio-economic indicators again (see Activity 4) – do these changes alter the score against the socio-economic indicators?
4. Enter the changes in CLEANED R – name it your memorable scenario name 2 (and then 3, 4, etc. for further repeat refinements)
5. Evaluate against the environmental indicators again (see Activity 5)
6. …and repeat – are they satisfied with the scenario now? If no, then start at 1 again. If yes, then look back at the day's experience and move on to answer the questions in the 'Conclusion'

Conclusion

Allow 20 minutes

The session concludes with the group providing four statements on the central compromises that they have made in reaching their preferred scenario:

1. What is the strength of their preferred vision? What do the like about it; what are they proud of? [This is what we seek to achieve]
2. What were they prepared to reduce in terms of socio-economic benefit, in order to improve environmental impact? [This is what we are prepared to compromise for environmental benefit]
3. What were they prepared to increase in terms of environmental impact, in order to improve socio-economic benefit? [This is what we are prepared to compromise for socio-economic benefit]
4. Which socio-economic and which environmental factors emerged as most important to them in their discussions? (List up to two of each). [This is what we are not prepared to compromise]
5. Were there any socio-economic or environmental factors that they felt were a barrier to or challenge in reaching their preferred scenario? [This is a potential problem for achieving our goals]

Or, if time is short:

1. Why was your scenario a success?
2. What difficulties did you encounter in agreeing on a new scenario?
3. What was the thing you learned most from the exercise?

Look to identify and express the key dimensions of acceptable environmental/ socio-economic trade-offs that could provide the basis for a "vision for livestock transformation". The focus is on a "vision" rather than a plan – where a vision is less detailed and is able to express the broad ambition of those present in the workshop.

Look for key assumptions and reasons embedded in what each group has (implicitly) deemed an acceptable trade-off.

- The focus is on the *reasons*. The similarity or difference between selected vignettes remains of interest, as, to a lesser extent, is the absolute number of animals. But both these factors are secondary to the judgement of trade-offs between socio-economic and environmental impacts.

Documentation:

Take note of:

i) what they could live with (and why),
ii) what they could not live with (and why),
iii) what changes they wanted to make for each scenario revision - what changes are the group willing to make? On some conditions? What changes are the group unwilling to make? and for all of these, why?

6 Note on tracking learning

If an ambition of carrying out this learning process is to monitor and document learning, then these are the methods we used, including some literature to refer to on learning outcomes. Plan this from the start, at the same time as designing the engagement process, so that you can plan what data to collect and monitor and consider how to collect it.

Central to the project was a recognition of the unequal power of different actors affected by the reform of livestock systems. Without due attention to how different groups of actors ('stakeholders') have access to resources, are exposed to risk, have influence in decision making, and have different types of knowledge, efforts to stimulate a shift towards intensification are liable to entrench current relations of power and equity. To address this in the project, we focused on three areas of concern: i) analysis of context; ii) stakeholder power relations; and iii) the learning space process. It is with ii) and iii) that we asked the facilitators to contribute with their observations and reflections.

We asked the facilitators to observe and reflect on the workshop process (the discussions and activities) a little bit critically and take particular note of relationships between stakeholders (who is present, who speaks, who doesn't) and examples of changes in understanding of different perspectives taking place during discussions (through tracing the language used over time). Following Lebel et al. (2010), there are three categories of learning that can occur in social learning processes, which we wanted to get reflections on, or examples of: **cognitive learning** (changes in actual knowledge), **normative learning** (changes in norms, values, or belief systems), and **relational learning** (building of trust, appreciation of others' worldviews, etc.). For example, are participants changing their views? Is it because they are understanding that there are alternative perspectives?

We also used pre-post questionnaires to gather perceptions of the stakeholders before and after each workshop about their knowledge and interaction with other stakeholders, their confidence in speaking out and being heard in the workshop, and their knowledge of what needs to change in the livestock system and perception of how much they are able to contribute to making that change happen. After the second workshop, we conducted semi-structured interviews with a few participants to have a more in-depth discussion about their experience of the workshop. See (Leys and Vanclay, 2011; Salvini et al., 2016; Giller et al., 2011) for some examples of how others have tracked learning in a variety of ways.

Den Haan and Van der Voort (2018) are also a useful reference for a review of the methods others have used to assess learning from using serious gaming – where games are used for a serious purpose such as education on an issue or for testing out scenarios and strategies to react to them. Data to assess learning can be collected before, during, immediately after and long after playing the game. The most common methods for collecting data are questionnaires, observations, debriefings, interviews, and data logging. Other methods include (Den Haan and Van der Voort, 2018):

- **Questionnaires**: Written or electronic questionnaires or surveys filled out by participants, often pre-post questionnaires which ask the same questions before and after the event to gather changes during the event
- **Observations**: Observations performed in-situ or based on recordings
- **Debriefings**: Formal analysis of the game's debriefing(s)
- **Interviews**: Interviews conducted with individual participants
- **Data Logging**: Data logged during gameplay, such as player decisions
- Control group: Data gathered through the use of a control group
- Perspective mapping: Classifying, interpreting and analysing different perspectives on promising paths for sustainable strategies (Offermans et al., 2011)
- Concept maps: Participants drawing structural representation of associations in relation to a topic (Ruiz-Primo and Shavelson, 1996)
- Interaction Analysis: Analysis of human-to-human as well as human-environment interactions (Jordan and Henderson, 1995)
- Social Network Analysis: Analysis of the affordances and hindrances to knowledge co-creation by structuring relationships (Serrat, 2017)

Jean et al (2018) provides an example of the sort of analysis that is possible if workshop sessions and discussions are recorded, either with audio or video or both, which provides a transcript that can be used to analyse the conversation in more detail. Jean et al (2018) use this to measure, among other things, the number of interactions between different stakeholders, to produce evidence that interaction between stakeholders can increase through playing collaborative games.

6.1 Facilitators' documentation of the discussions and their observations and reflections

The facilitators should broadly document key points raised in the discussion, and what was the reasoning given for making those points. This is to document not just the final agreed output, but also the journey to arriving at the output, particularly if the meetings are not being audio-recorded. Ideally, if points and arguments can be tagged to who said what, it will help with analysing who contributed and how perspectives and narratives might have changed during the course of the discussion.

Below is a list of questions/topics that could guide what to look out for. We were looking for two types of notes: i) observing an example of an interaction or change of view, and ii) making a personal reflection on the process. For example: an observation is that participant x changed his views when realising that there are other alternatives possible; whereas a reflection would be that in general, group x has more diverse views than group y.

- Building stakeholding and joint responsibility (Stakeholding is the relationship between understandings of what is 'at stake' and stakeholder legitimacy)
  - Who is talking?
  - Who is not talking? Who is doing too much talking? (look out for e.g. gender, youth, other social divides - which are important in this area?)
  - Why are some people not talking? Is there something we can do about it?
- Missing stakeholders
  - Who is still needed at the table to resolve certain questions/issues - who might these be?
- Tracking changes in understanding
  - How are the participants narrowing down from several views to one or a few streamlined views? Particularly when there are differences in perception of what the 'issue' or 'problem' is - for example, either low yielding animals vs too few animals - both give too little meat.
  - Where are there differences in views?
  - What views are common? I.e. where does everyone have the same assumption/ opinion/ view?
  - When did participants have a change in view? What prompted the change in view?
- Reflections on your experiences of facilitating the discussion.

More broadly, we looked for observations such as:

- Points of difference – e.g. different evaluations offered for the indicators, different reactions to scenarios etc.
- Points of agreement – something they immediately agreed on?
- Changes in perspective? What prompted individuals to change their view?
- What trade-offs were made in choosing/ accepting the final choice?

And reflections such as:

- What were the reactions to information provided in that session, for example by the tool, or by other stakeholders?
- How will people in the study area be affected differently by the issue being discussed? How? And for what reason?
- What kind of discussion was it? E.g. Did everyone contribute their reactions and evaluations of the scenario? Did a few people speak for everyone?
- Anything else interesting

7 Facilitation tips and skills for inclusive participation and shared learning

Key outcomes that the facilitator will be aiming for, to create an enabling environment for social learning and transformative change are (Ensor and Harvey, 2015; Muro and Jeffrey, 2008; Salvini et al., 2016):

a) co-creation of knowledge;
b) reflection and recognition of others' perspectives and others' underlying goals and values;
c) understanding complexity and interdependence, leading to
d) (partial) convergence of goals (vision),
e) mutual agreement and
f) collective or coordinated action

This document outlines some best practices for achieving an enabling environment for shared learning and change, based on educational and social learning literature (see bibliography). For more explanation, detail and examples, see the 'Facilitator's Guide to Participatory Decision-making' by Sam Kaner (2014).

7.1 General rules and qualities of a good facilitator

- Respect participants and listen to their ideas - they are the experts!
- Be approachable, impartial and open to all perspectives - and make sure the participants perceive this too
- Provide sufficient time and space for participants to gather their thoughts and contribute to discussions
    - E.g. when you ask 'Are there any questions?' or similar - allow enough time for people to gather their thoughts, don't be afraid of silence
- Be able to ask the questions flexibly to help participants understand the question (know the topic) - but also don't bias the responses if you give examples while trying to explain the question!
- Step back when a group is functional/functioning – help participants become independent learners and take control of their learning
- Ensure that the process maintains safety of the participants - that there is no risk in them participating
- Be aware of changes of energy in the room - also be aware of changes of role of the participant as they switch between being active, reflecting, chewing over new knowledge; individual viewpoints vs group collaborative creation
- Have group sizes of 4-6, and no more than 8 to maximise opportunity for all participants to contribute adequately
- Have an energiser after lunch!!

7.2 Stages of the group process

Before the event, ensure access to the process, openness regarding the agenda, transparency of the process - think here about language, whether intended participants know about the workshop, know what is happening and why, etc.

7.2.1 Set the learning agenda

Lay out the aims of the activity clearly at the start, and how we're going to get there (what we're doing in this activity).

7.2.2 Set ground rules

Be clear up front about what is expected from the participants and from the facilitator – much may be obvious courtesy, but it is worth repeating.

- Listen to each other, and respect what they have to say - allow everyone else also time and space to speak, only have one conversation going at once
- Engage actively, and share all relevant information
  - Be confident about sharing different opinions and views as this is when we learn from each other - remember not everyone has the same experiences and priorities
  - It's ok to say you don't know or don't understand – and there is no such thing as a stupid question
- The group is responsible for the deliverables – if you don't agree with something that has been recorded then say so
- Discussions and criticisms will focus on interests and not on people
  - Give specific examples, or share personal experiences, rather than make general statements about groups of people (stereotyping)
  - If we challenge others' ideas, back it up with evidence, appropriate experiences, and/or appropriate logic.
- Keep to time - the sessions will start and end on time and will start on time after breaks
- Let the facilitator know if something is not as you expect - we all take responsibility for monitoring this meeting

7.2.3 Guide and moderate the discussion

Keep the dialogue **open and inclusive**:

- Draw people out - highlight that a diversity of perspectives is an essential part of the process - it gives all participants a voice
  - Don't allow only dominant speakers to take over the discussion
  - Encourage quiet ones to make contributions
- Be aware of barriers to participation (cultural norms, social difference, power relations etc.) and try to support participants to get past these – but respect it if they do not wish to speak
- Allow all to write down their ideas at the beginning and keep all this info on flipcharts
- Encourage people to share their personal experiences with the topic – less daunting
- Clarify if you are unclear about a participant's meaning or intent

Promote shared **understanding**:

- Recognise different opinions/ understandings/ worldviews and be aware of your own frame of reference
  - Encourage participants to clarify and challenge these frames of reference/ worldviews/ assumptions
  - Encourage people with diverse views to share experiences and consider opposing view points
- Use inclusive language - don't use jargon, or language that makes part of the group uncomfortable
- Remain impartial and keep listening
- When drawing on the maps, or if participants are making notes: be aware of if everyone doesn't agree with what was drawn/written, for example because the drawer/ writer just went on with his own thoughts; and don't let the same people do all the drawing - e.g. hold all the pens and pass them out, changing colour regularly to move on to another person

Keep everyone **involved**:

- Use eye contact to keep people engaged
- Invite people to make their point, but respect if they don't want to - i.e. provide the opportunity if they need/want to say something (Note that people often look grumpy when they're concentrating)
- Write contributions down – or invite participants to do so - on flipchart, post-its, maps etc.
- Paraphrase and ask follow up questions to clarify and bring out their ideas further
- Re-visit past contributions and add them to later discussions

- Encourage others to give reactions or build on someone else's comments
- Don't be afraid to be ignorant - ask the group to provide knowledge, expertise etc.
- Keep it interesting and stimulating – have a variety of tasks and activities

Keep the discussion constructive and positive, keep it on track, resolve conflicts.

Don't force consensus - all viewpoints are valid - we all have different expertise and experience; be sure to record all views and why consensus could not be reached.

Try to keep politics out of it.

7.2.4 Reflection and closure

Check back on which issues of concern have been addressed, and how the frames of reference have been changed as a result of the learning process; provide a summary in closure and reiterate key points; show how progress has been made. Ask if participants learned anything – it's ok if they didn't – giving them the opportunity to reflect individually on their experience.

7.3 Troubleshooting tips

The one who talks too much

- Redirect discussion to another speaker or topic, or ask them to act as observers for a few minutes and report back their observations to the group
- Use body language - turn slightly away from them to pointedly ask the rest of the group the question

The one who talks too little

- Make opportunities for smaller groups, or pair-wise discussions
- Ask opinion questions - these are easier to answer, and there is less responsibility to be correct
- Point to their expertise to try to draw them out - i.e. connecting with something that is different to the dominant speaker, e.g. 'we've heard from the vet, now you supply feed, what do you think? Do you have anything to add?'
- Open the question up to the group again
- Ask for written answers/ contributions
- Use brainstorming sessions and open forum sessions which have time specifically for turn-taking and recording of view points

Resolving arguments

- Look up the facts together, if that will solve the argument
- Discuss how the answer could be reached if it could be made into an experiment
- If the argument is about values, use the opportunity to highlight/ draw out the differences in views
- Take a position as moderator - ensure participants do not talk over each other – reiterate the ground rules: e.g. asking participants to focus conflict on ideas rather than people and to resist being judgmental
- List both sides of the argument on flipchart – and if it can't be resolved, let that stand as a record of both versions, why it can't be resolved, and move on

Unclear or hesitant comments

- Encourage participant to explain further or give examples to illustrate their point, allow time to answer, support with encouraging cues and patience
- Restate their comment for confirmation or rejection

Discussion going off track

- Keep track of questions to be covered on flipchart/ board/ visible - ask participants to summarise where the group is up to with the questions, when it seems to be going off-track

The one who confronts the facilitator - 'I don't believe you' or 'How do you really know that' etc.

- Don't take the bait - give them recognition and move on; or turn the question back to the participant 'This is what I'm saying; what is your perspective?'
- Ask for the context behind their question; or clarify the assumptions behind their argument and encourage them to see alternative possibilities
- Paraphrase what they said to check you got the right message from them
- Defer - suggest that you see them afterwards to continue that disagreement and move on

8   Useful resources and further reading

8.1   Facilitation skills

Kaner, Sam. 2014. *Facilitator's Guide to Participatory Decision-Making*. 3rd ed. San Franciso, CA: Jossey-Bass, Wiley. – this is the text used in training the facilitators in our project, particularly taking from Chapter 4.

For more creative and energetic engagement activities, there are a range of facilitation books and online collections of resources around for inspirations. Some examples include: http://learningforsustainability.net/facilitation/ or https://www.seedsforchange.org.uk/resources.

Open Space is another example of a method for enabling multi-stakeholder, co-creative dialogue around a shared issue of importance, not something we used but looks like a useful alternative and a useful collection of resources - http://www.chriscorrigan.com/parkinglot/open-space-resources/

References used in drawing up the tips on facilitation skills in Section 7:

Blackmore, Chris; van Bommel, Severine; de Bruin, Annemarieke; de Vries, Jasper; Westberg, Lotten; Powell, Niel; Foster, Natalie; Collins, Kevin; Roggero, Pier Paolo and Seddaiu, Giovanna (2016). Learning for Transformation of Water Governance: Reflections on Design from the Climate Change Adaptation and Water Governance (CADWAGO) Project. *Water*, **8(11)**, article no. 510.

CDC (2016). *Facilitation Tip Sheet*. Public Health Information Network's Communities of Practice Resource Kit, Centres for Disease Control and Prevention. Available from: https://www.cdc.gov/phcommunities/resourcekit/resources.html#facilitation_tip_sheet , accessed 19 June 2017

Cundill, G. (2010). Monitoring social learning processes in adaptive comanagement: three case studies from South Africa. *Ecology and Society* **15(3):** 28. [online] URL: http://www.ecologyandsociety.org/vol15/iss3/art28/

Cuppen, E. (2012). A quasi-experimental evaluation of learning in a stakeholder dialogue on bio-energy, *Research Policy*, **41(3):** 624-637, ISSN 0048-7333, http://dx.doi.org/10.1016/j.respol.2011.12.006.

Ensor, J. and Harvey, B. (2015). Social learning and climate change adaptation: evidence for international development practice. *WIREs Climate Change*, **6**: 509–522. doi: 10.1002/wcc.348

Harry Sheridan Center for Teaching and Learning, (nd). *Facilitating Effective Group Discussions: Tips*. Website, Brown University, Accessed: https://www.brown.edu/about/administration/sheridan-center/teaching-learning/effective-classroom-practices/discussions-seminars/facilitating

Harvey, B., Ensor, J., Garside, B., Woodend, J., Naess, L.O., and Carlile, L. (2013). Social learning in practice: A review of lessons, impacts and tools for climate change. CCAFS Working Paper no. 38. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org

Leys, Andrea J., and Jerome K. Vanclay, (2011). Social learning: A knowledge and capacity building approach for adaptive co-management of contested landscapes, *Land Use Policy*, **28(3)**: 574-584, ISSN 0264-8377, http://dx.doi.org/10.1016/j.landusepol.2010.11.006.

Lynam, T., W. De Jong, D. Sheil, T. Kusumanto, and K. Evans. 2007. A review of tools for incorporating community knowledge, preferences, and values into decision making in natural resources management. *Ecology and Society* **12(1)**: 5. [online] URL: http://www.ecologyandsociety.org/vol12/iss1/art5/ or http://www.ecologyandsociety.org/issues/article.php/1987

Reed, Mark S. (2008). Stakeholder participation for environmental management: A literature review, *Biological Conservation*, **141(10):** 2417-2431, ISSN 0006-3207, http://dx.doi.org/10.1016/j.biocon.2008.07.014.

Van Epp, M. and B. Garside. (2014). *Monitoring and Evaluating Social Learning: A Framework for Cross-Initiative Application.* CCAFS Working Paper no. 98. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org

Wals, Arjen. E.J., Noor van der Hoeven, and Harm Blanken. (2009). *The acoustics of social learning: Designing learning processes that contribute to a sustainable world.* Wageningen Academic Publishers, Wageningen. ISBN 978-90-8832-009-5. Available at: http://edepot.wur.nl/108487

8.2   Social learning

CCAFS collection of work from their Climate Change and Social Learning Initiative, with a range of useful working papers, briefings, blog and journal articles covering social learning and how to do it: https://ccafs.cgiar.org/climate-change-and-social-learning-initiative

Key authors on social learning: Ray Ison, Blane Harvey, Romina Rodela, Claudia Pahl-Wostl, Chris Blackmore, Mark S. Reed, Petra Tschakert, Stephen Rist

9   References

Armitage, D.R., Plummer, R., Berkes, F., Arthur, R.I., Charles, A.T., Davidson-Hunt, I.J., Diduck, A.P., Doubleday, N.C., Johnson, D.S., Marschke, M., McConney, P., Pinkerton, E.W., Wollenberg, E.K., 2009. Adaptive co-management for social–ecological complexity. Frontiers in Ecology and the Environment 7, 95–102. https://doi.org/10.1890/070089

Berkes, F., 2009. Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. Journal of Environmental Management 90, 1692–1702. https://doi.org/10.1016/j.jenvman.2008.12.001

Blackmore, C., 2007. What kinds of knowledge, knowing and learning are required for addressing resource dilemmas?: a theoretical overview. Environmental Science & Policy 10, 512–525. https://doi.org/10.1016/j.envsci.2007.02.007

Bouwen, R., Taillieu, T., 2004. Multi-party collaboration as social learning for interdependence: developing relational knowing for sustainable natural resource management. Journal of Community & Applied Social Psychology 14, 137–153. https://doi.org/10.1002/casp.777

Collins, K., Ison, R., 2009. Jumping off Arnstein's ladder: social learning as a new policy paradigm for climate change adaptation. Env. Pol. Gov. 19, 358–373. https://doi.org/10.1002/eet.523

Collins, K.B., Ison, R.L., 2010. Trusting Emergence: Some Experiences of Learning about Integrated Catchment Science with the Environment Agency of England and Wales. Water Resour Manage 24, 669–688. https://doi.org/10.1007/s11269-009-9464-8

Colvin, J., Blackmore, C., Chimbuya, S., Collins, K., Dent, M., Goss, J., Ison, R., Roggero, P.P., Seddaiu, G., 2014. In search of systemic innovation for sustainable development: A design praxis emerging from a

decade of social learning inquiry. Research Policy 43, 760–771. https://doi.org/10.1016/j.respol.2013.12.010

Den Haan, R.-J., Van der Voort, M.C., 2018. On Evaluating Social Learning Outcomes of Serious Games to Collaboratively Address Sustainability Problems: A Literature Review. Sustainability 10, 4529. https://doi.org/10.3390/su10124529

Ensor, J., 2011. Uncertain futures: adapting development to a changing climate. Practical Action Publishing, Rugby.

Ensor, J., Harvey, B., 2015. Social learning and climate change adaptation: evidence for international development practice. WIREs Clim Change 6, 509–522. https://doi.org/10.1002/wcc.348

Erb, K.-H., Lauk, C., Kastner, T., Mayer, A., Theurl, M.C., Haberl, H., 2016. Exploring the biophysical option space for feeding the world without deforestation. Nature Communications 7, 11382. https://doi.org/10.1038/ncomms11382

Fazey, I., Fazey, J.A., Fischer, J., Sherren, K., Warren, J., Noss, R.F., Dovers, S.R., 2007. Adaptive capacity and learning to learn as leverage for social–ecological resilience. Frontiers in Ecology and the Environment 5, 375–380. https://doi.org/10.1890/1540-9295(2007)5[375:ACALTL]2.0.CO;2

Giller, K.E., Tittonell, P., Rufino, M.C., van Wijk, M.T., Zingore, S., Mapfumo, P., Adjei-Nsiah, S., Herrero, M., Chikowo, R., Corbeels, M., Rowe, E.C., Baijukya, F., Mwijage, A., Smith, J., Yeboah, E., van der Burg, W.J., Sanogo, O.M., Misiko, M., de Ridder, N., Karanja, S., Kaizzi, C., K'ungu, J., Mwale, M., Nwaga, D., Pacini, C., Vanlauwe, B., 2011. Communicating complexity: Integrated assessment of trade-offs concerning soil fertility management within African farming systems to support innovation and development. Agricultural Systems, Methods and tools for integrated assessment of sustainability of agricultural systems and land use 104, 191–203. https://doi.org/10.1016/j.agsy.2010.07.002

Ison, R., Röling, N., Watson, D., 2007. Challenges to science and society in the sustainable management and use of water: investigating the role of social learning. Environmental Science & Policy, Social Learning: an alternative policy instrument for managing in the context of Europe's water 10, 499–511. https://doi.org/10.1016/j.envsci.2007.02.008

Jean, S., Medema, W., Adamowski, J., Chew, C., Delaney, P., Wals, A., 2018. Serious games as a catalyst for boundary crossing, collaboration and knowledge co-creation in a watershed governance context. Journal of Environmental Management 223, 1010–1022. https://doi.org/10.1016/j.jenvman.2018.05.021

Jordan, B., Henderson, A., 1995. Interaction Analysis: Foundations and Practice. The Journal of the Learning Sciences 4, 39–103.

Lebel, L., Grothmann, T., Siebenhüner, B., 2010. The role of social learning in adaptiveness: insights from water management. Int Environ Agreements 10, 333–353. https://doi.org/10.1007/s10784-010-9142-6

Lewis-Beck, M., Bryman, A., Futing Liao, T., 2004. The SAGE Encyclopedia of Social Science Research Methods. Sage Publications, Inc., 2455 Teller Road, Thousand Oaks California 91320 United States of America. https://doi.org/10.4135/9781412950589

Leys, A.J., Vanclay, J.K., 2011. Social learning: A knowledge and capacity building approach for adaptive co-management of contested landscapes. Land Use Policy 28, 574–584. https://doi.org/10.1016/j.landusepol.2010.11.006

Mehrabi, Z., Seufert, V., Ramankutty, N., 2017. The Conventional Versus Alternative Agricultural Divide: A Response to Garibaldi et al. Trends in Ecology & Evolution 32, 720–721. https://doi.org/10.1016/j.tree.2017.07.011

Muro, M., Jeffrey, P., 2008. A critical review of the theory and application of social learning in participatory natural resource management processes. Journal of Environmental Planning and Management 51, 325–344. https://doi.org/10.1080/09640560801977190

Notenbaert, A., Lannerstad, M., Herrero, M., Fraval, S., Ran, Y., Paul, B.K., Mugatha, S., Barron, J., Morris, J., 2014. A framework for environmental ex-ante impact assessment of livestock value chains. Presented at the 6th All Africa Conference of Animal Agriculture, International Center for Tropical Agriculture (CIAT), Nairobi, Kenya.

Offermans, A., Haasnoot, M., Valkering, P., 2011. A method to explore social response for sustainable water management strategies under changing conditions. Sustainable Development 19, 312–324. https://doi.org/10.1002/sd.439

Pfeifer, C., 2019. CLEANED R - an ex-ante, landscape level environmental impact assement tool assessing changes from transforming livestock value chains. Stockholm Environment Institute and International Livestock Research Institute, Nairobi, Kenya.

Pfeifer, C., Morris, J., Ensor, J.E., 2019. The CLEANED R tool: Generic manual. Stockholm Environment Institute, York.

Pfeifer, C., Morris, J., Mulatu, D.W., Wakeyo, M., Hruy, G., Ensor, J., 2018a. CLEANED-R Documentation: Conceptual overview of CLEANED and parameterisation of a CLEANED-R tool for Atsbi, Ethiopia. (SAIRLA Project report). Stockholm Environment Institute, York.

Pfeifer, C., Morris, J., Ouedraogo, S., Ensor, J., 2018b. CLEANED Documentation: Conceptual overview of CLEANED and parameterisation of a CLEANED tool for Bama, Burkina Faso (SAIRLA Project report). Stockholm Environment Institute, York.

Pfeifer, C., Morris, J., Soka, G., Moses, E.A., Ensor, J., 2018c. CLEANED-R Documentation: Conceptual overview of CLEANED and parameterisation of a CLEANED-R tool for Lushoto, Tanzania (SAIRLA Project report). Stockholm Environment Institute, York.

Ruiz-Primo, M.A., Shavelson, R.J., 1996. Problems and issues in the use of concept maps in science assessment. Journal of Research in Science Teaching 33, 569–600. https://doi.org/10.1002/(SICI)1098-2736(199608)33:6<569::AID-TEA1>3.0.CO;2-M

Salvini, G., van Paassen, A., Ligtenberg, A., Carrero, G.C., Bregt, A.K., 2016. A role-playing game as a tool to facilitate social learning and collective action towards Climate Smart Agriculture: Lessons learned from Apuí, Brazil. Environmental Science & Policy 63, 113–121. https://doi.org/10.1016/j.envsci.2016.05.016

Serrat, O., 2017. Social Network Analysis, in: Serrat, O. (Ed.), Knowledge Solutions: Tools, Methods, and Approaches to Drive Organizational Performance. Springer Singapore, Singapore, pp. 39–43. https://doi.org/10.1007/978-981-10-0983-9_9