



WAGENINGEN
UNIVERSITY & RESEARCH

Livestock Sustainability Assessment Tool

USER MANUAL

Online version

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1. Introduction

The Livestock Sustainability Assessment Tool (LSAT) has been designed to guide discussions on the integral sustainability of livestock production systems, such as Dairy, Beef and Agro-Pastoral systems, with a potential application in different geographical regions. Such discussions may aim at:

- i) identifying the main threats to sustainability at farm, regional or national level;**
- ii) scoring the selected farm, region or country on its current performance based on sustainability aspects (criteria), using indicators relevant to that context; and**
- iii) identification of critical areas for further elaboration on pathways and actions to increase sustainability.**

What is integral sustainability? Sustainability is most often defined as meeting the needs of the present without compromising the ability of future generations to meet theirs. It has three main pillars: economic, social, and environmental sustainability. The economic sustainability for livestock farming systems is concerned with the ability of farmers to produce an amount of animal product that is sufficient to keep the economic viability of the farm and to meet the nutritional needs of themselves and their community. The social sustainability refers to equity and quality of life of farmers, consumers, and members of the community. The Environmental sustainability refers to maintaining or improving environmental quality and the natural resource base.

What does LSAT do? The tool gives a snapshot of the sustainability of the selected systems (dairy, beef, agro-pastoralism) at a selected level (farm, region or country scale), based on selection and scoring of aspects and indicators by insiders/experts. This assessment can facilitate debates on how sustainability of a system could be improved. The tool is a qualitative, rapid assessment tool that relies on insiders providing knowledge and information for its use.

What does LSAT not do? It does not give absolute values of how different aspects and indicators affect the sustainability of the selected livestock sector. Though LSAT does not give specific solutions of how sustainability can be improved, it can guide measures to be taken in providing solutions.

How is this manual set up? Section 2 outlines in general terms the main process that needs to be followed in using LSAT, starting from choosing the sector (dairy, beef, or agropastoral) and the level of assessment (farm, region, or country), the selection of relevant sustainability aspects, selection and scoring of indicators and review of results. Sections 3 and 4 outline the steps involved in using LSAT, either for individual users (Section 3) or for multiple users (Section 4).

Two other documents are available next to this Manual: A Guide for facilitation of workshops for multiple users, and an explanation of aspects and indicators.

2. The four main steps involved in using LSAT

A. Choosing the system (sector) and level of assessment

On the first page, users can select their preferred language and are asked to select the type of assessment. Click on **Individual assessment** to use LSAT as an individual. . Click on **Group assessment** to use LSAT jointly in a workshop. Selection of an option brings you to the next screen. For more detailed explanations and screenshots of the pages, see Sections 3 and 4.




To start an Individual assessment, the user must then select the type of livestock system/sector he/she would like to assess: Dairy, Beef, Agropastoral (only one) and **Confirm type**.

In the case of a group assessment, the type of livestock system/sector and level of assessment will be previously selected and entered by the facilitator. The users must only enter the code provided by the facilitator and **Submit** it.

Next, the user needs to complete the personal user information, assessment information (fill in your name and location of assessment), and select assessment level (only for individual assessment, not in the case of a group assessment, as this is preselected by the facilitator). To enable use of the tool across multiple scales, three levels are offered: national level, regional level, and farm level. The regional level focuses on a geographic region or areas with a single or limited number of farming systems and can be seen as an intermediate level between farm and national level. Region boundaries have to be defined by the user(s).

After filling in all required information, click on **Start assessment**.

B. Aspect selection

The three pillars or domains or dimensions of sustainability, economic , social , and environmental , are informally referred to as profit, people, and planet. To properly cover these three pillars, the tool gives the option to select a number of aspects that the user considers to be critical threats to the sustainability of the selected system. These aspects are recognized areas of sustainability, such as soil health, biodiversity, profitability, inclusion and animal care among others. Although some are clearly linked to one particular sustainability domain/dimension, most aspects cover more than one domain.

When using the tool, users are expected to select the most relevant aspects in their local context, i.e., those aspects that identify the most important threats to sustainability of the dairy/beef/agropastoral system assessed. It is important to keep a good balance of aspects in the social, economic and environmental sustainability pillars. To aid in aspect selection, consult "[Explanation of aspects and indicators in the Livestock Sustainability Assessment Tool](#)" document.

At least 3 aspects need to be selected. The ideal number is 6 – 8 aspects. After selection, click on **Select aspects**.

C. Indicator selection and indicator scoring

An indicator is considered an observable variable for estimating or measuring dimensions of a concept, such as sustainability of a livestock production system. It can be used to assess relevant aspects. The indicators are important tools for communicating scientific and technical information, since they can stimulate discussions by diverse groups of users, allowing them to transform information into action (Segnestam et al., 2000). In this way, the indicators are not only useful for the evaluation of situations or decisions, but they can also play an active role in monitoring the improvement of the assessment process, in the formulation of policies and planning by the authorities, and in the design of interventions and strategies by sector stakeholders. To aid in indicator selection, consult "[Explanation of aspects and indicators in the Livestock Sustainability Assessment Tool](#)" document.

On the "**Indicator selection**" page (**Figure 1**), you are expected to select the indicators most fitting for the local context. At the top this page you can also see how many indicators have been selected for

each sustainability dimension, to help you ensure a good balance. After completing the selection of indicators, click on **Select indicators**.

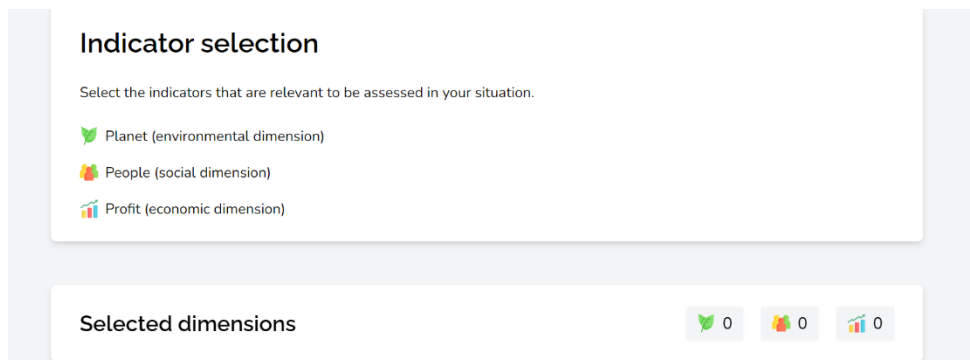


Figure 1: Selected dimensions of sustainability

On the **Scoring** page (Figure 2), the selected aspects each have their own Tab. Switching to the next Aspect is automatic after clicking on **Next**. Users can also manually choose a particular aspect by clicking on it. On this page, the selected indicators have to be scored. Scoring of the indicators follows a standardized procedure: Participants select the appropriate score level out of a set of 4 levels, ranging from low/poor (red) score to high/good score (green). By clicking **Confirm** on the page of the last selected Aspect, scoring is completed. However, if one or more selected indicators are not scored, the warning **All aspects must be fully assessed** appears and user has to return to the Aspect page with unscored indicator(s), by clicking on **Previous**.

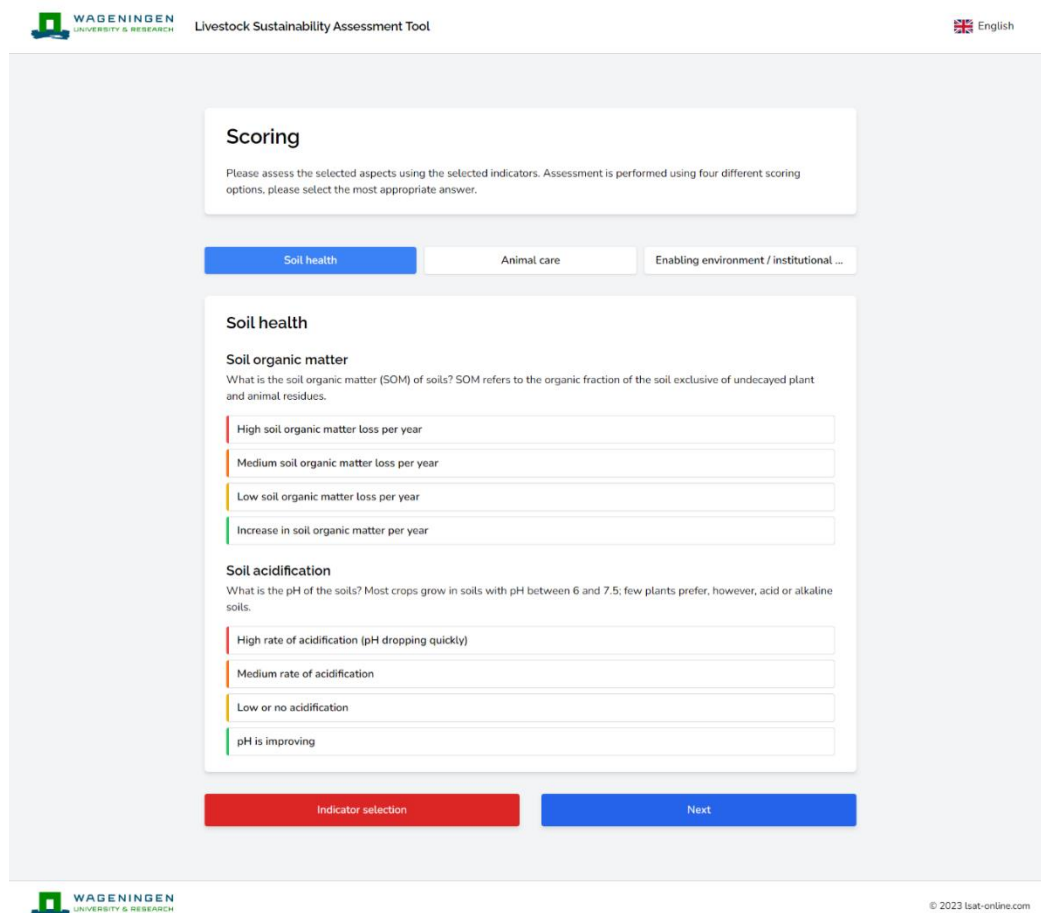


Figure 2: Scoring of indicators

D. Review of results

After all the scores have been entered, the Reporting page offers an overview of the results with a radial chart and a table with the scores per aspect, a table with the average sustainability score across the people (social), profit (economic), and planet (environment) domains, and an overview of the excluded aspects.

Users can review these results, covering questions such as:

- 1. Do these results align with your impressions about the sustainability of the assessed dairy/beef/agro-pastoral system?**
- 2. Have you made a proper selection of aspects and indicators? Do you have a proper balance between people, profit and planet domains? If not, you can go back to the aspect and indicator selection pages and adjust the selection.**
- 3. Is there any aspect for which you would like to review the indicator scores? If so, you can go back to the indicator scoring pages and adjust the scores.**
- 4. Are any of the scores higher or lower than you expected? Was there a high deviation in the scoring by group members? Should you (collectively) decide to change the (average) score?**

By clicking on **Edit scores**, individual users can return to the Scoring page. In the group assessment, the facilitator can enter the scores resulting from group discussions.

E. Finalizing the assessment

Once you are satisfied with the results, please don't forget to **Save results** and to **Print** to printer or to PDF.

3. Step-by-step explanation of the tool – for individual use

INITIAL PAGE (Figure 3)

Please read the general information and instructions in the information box on this page.

Please select your preferred language.

For more information about using the tool or for the scientific background, please read the manual and supporting documents, or watch the video clip.

[Click "Individual assessment" to proceed]

WAGENINGEN UNIVERSITY & RESEARCH Livestock Sustainability Assessment Tool Login English

WAGENINGEN UNIVERSITY & RESEARCH

Livestock Sustainability Assessment Tool

The Livestock Sustainability Assessment Tool (LSAT) was developed by Wageningen Livestock Research to facilitate dialogue on integral sustainability of livestock production. The LSAT helps companies, cooperatives, organizations and broad groups of stakeholders to discuss the sustainability of livestock at national level, in a certain region, or at farm level.

The LSAT tool has a common approach which has been tailored to fit for various livestock species or production systems, specified through modules such as: dairy; beef; agro-pastoralism; and aquaculture. Using a stepwise approach, the tool assesses the social, environmental, and economic aspects of sustainability of livestock farming systems. This is done by identifying the main threats to sustainability and scoring them by using a selection of indicators. The tool can be used by individuals or by groups (in which case a group session needs to be registered), in each step of the assessment, the required information or instruction is provided on the top of the opened window.

For more information about using the tool or for the scientific background, please read the [manual](#) , and [supporting documents](#) or watch this [video clip](#) .

For any other questions, please feel free to contact developers at wlrinternational.team@wur.nl

Individual assessment Group assessment

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Figure 3: Initial assessment page

START INDIVIDUAL ASSESMENT (Figure 4)

1. Type selection

Select the type of system / sector you would like to assess: Dairy, Beef, Agropastoral (only one) and click on "**Confirm type**".

The screenshot shows a web interface for starting an individual assessment. At the top, it says 'Start individual assessment' and 'To start a new individual assessment please fill the form below.' Below this is a section titled 'Type of tool' with three radio button options: 'Dairy', 'Beef', and '(Agro)pastoralist'. At the bottom of the form are two buttons: a red 'Cancel' button and a dark grey 'Confirm type' button. The page header includes the Wageningen University & Research logo and 'Livestock Sustainability Assessment Tool' on the left, and 'English' on the right. The footer includes the Wageningen University & Research logo and '© 2023 lsat-online.com'.

Figure 4: Selection of assessment type for individual assessment

GENERAL INFORMATION (Figure 5)

1. User information

Fill your personal information according to the characteristics & groups you identify best with

Stakeholder group: Select the stakeholder group you most closely identify with

Country: Fill in the country of the user

Region: Fill in the region where the user lives

Age group: Select the age-group you belong to

Education level: Select the highest level of education that you have completed

Gender: Select your gender

2. Assessment

User identifier

Location of assessment

3. Assessment Level

Choice of level that will be assessed: farm, regional, or national level.

[Click "Start Assessment"]

Start individual assessment

To start a new individual assessment please fill the form below.

User information

Please fill in your personal information below, according to the characteristics & groups you identify best with.

Stakeholder group *

Country *

Region

Age group *

Education level *

Gender *

Assessment

User identifier

Location of assessment

Assessment level

National

Regional

Farm

Figure 5: Filling of general information for individual assessment

ASPECT SELECTION PAGE (Figure 6)

Select the Aspects that you consider most significant for sustainability of livestock type and level selected, by ticking in the box next to the Aspect to be selected. At least three aspects need to be selected to continue. The recommended number of aspects to be selected is 6 to 8, with an eye on the desired balance between the people, profit and planet dimensions. Selecting too many aspects offers the risk of losing focus on the key drivers of the system to be analyzed.

[Click "Select Aspects"]

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UNIVERSITY & RESEARCH Livestock Sustainability Assessment Tool English

Aspect selection

Select about 7 aspects that reflect the most important sustainability issues for your situation.

Aspects

- Select all
- Soil health
- Water management
- Biodiversity
- Resource use & environmental impact
- Animal care
- Impact on human health and nutrition
- Voice in decision making at different levels
- Enabling environment / institutional support
- Access to production factors
- Profitability
- Competition for land use between human food and animal feed
- Livelihood opportunities and working conditions in the sector
- Access to markets and services
- Self-sufficiency in production

Abort Select aspects

Figure 6: Selection of the most relevant aspects

INDICATOR SELECTION PAGE (Figure 7)

All indicators belonging to the selected aspects are displayed.

Tick the box next to the indicator to select the indicators that you consider to be relevant for the case study.

You can also return to this page later to select or deselect indicators.

[Click "Select Indicators"]

Indicator selection

Select the indicators that are relevant to be assessed in your situation.

- Planet (environmental dimension)
- People (social dimension)
- Profit (economic dimension)

Selected dimensions
 0 0 0

Soil health

Select all

- Soil organic matter ▶ 🌿 🧑 📊
- Soil acidification ▶ 🌿 🧑 📊
- Soil erosion ▶ 🌿 🧑 📊
- Soil compaction ▶ 🌿 🧑 📊

Animal care

Select all

- Animal health ▶ 🐔 🧑 📊

Enabling environment / institutional support

Select all

- Level playing field ▶ 🐔 🧑 📊
- Essential infrastructure services ▶ 🐔 🧑 📊
- Institutions ability to deal with major shocks ▶ 🐔 🧑 📊
- Budget invested in research, extension and education benefiting the sector ▶ 🌿 🧑 📊
- Natural resource governance ▶ 🌿 🧑 📊

Access to production factors

Select all

- Access to credit ▶ 🐔 🧑 📊
- Availability and skill level of household and hired labour ▶ 🐔 🧑 📊
- Feed availability ▶ 🐔 🧑 📊
- Access to land ▶ 🐔 🧑 📊

Competition for land use between human food and animal feed

Select all

- Proportion of land used for forage or grazing that could be used for food crops ▶ 🌿 🧑 📊
- Proportion of cropping encroachment to grazing land ▶ 🌿 🧑 📊

Aspect selection

Select indicators

Figure 7: Selection of most relevant indicators

In case you want to select or deselect Aspects, click "Aspect Selection", to go back to the aspect selection page.

SCORING PAGE (Figure 8)

On these pages (one page per selected aspect), all selected indicators need to be scored by clicking one of the four statements. Four scoring options are available: 1 for red (not sustainable), 2 for orange (not so sustainable), 3 for yellow (quite sustainable) and 4 for green (highly sustainable).

After finishing the scoring, an error message will appear if any selected indicators have not been scored.

[Click "Confirm" to proceed]

WAGENINGEN UNIVERSITY & RESEARCH Livestock Sustainability Assessment Tool English

Scoring

Please assess the selected aspects using the selected indicators. Assessment is performed using four different scoring options, please select the most appropriate answer.

Soil health Animal care Enabling environment / institutional ...

Soil health

Soil organic matter

What is the soil organic matter (SOM) of soils? SOM refers to the organic fraction of the soil exclusive of undecayed plant and animal residues.

High soil organic matter loss per year

Medium soil organic matter loss per year

Low soil organic matter loss per year

Increase in soil organic matter per year

Soil acidification

What is the pH of the soils? Most crops grow in soils with pH between 6 and 7.5; few plants prefer, however, acid or alkaline soils.

High rate of acidification (pH dropping quickly)

Medium rate of acidification

Low or no acidification

pH is improving

Indicator selection Next

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Figure 8: Scoring of indicators

In case you want to select or deselect indicators click "*Indicator Selection*", to go back to the indicator selection page

REPORT PAGE (Figure 9)

On this screen the results of the assessment are provided:

- **The first table shows the average scores per aspect. The second table shows the number of selected indicators, for each of the Planet, People and Profit dimensions, as well as the average score per dimension. The third table lists the aspects that have not been selected**

- **The radial chart (spiderweb) shows the sustainability status of the assessed system using a traffic light display, to help users.**
 - **Red indicates that the measure or goal needs additional attention and resources allocated towards it, to get things on track towards sustainability.**
 - **Yellow indicates that the measure or goal is close to being on track or might be easily corrected if the right measures are taken.**
 - **Green indicates that the aspect is in sustainable condition or requires less attention when targeting improvement of sustainability.**

Once the assessment is finished, please save your results on the database by pressing **"Save results"**. If one would like to simulate a future scenario, data of the current run can be saved, or printed and a new run can be filled in **"Edit scores"**. Of course, reports can also be printed or saved as PDF files.

If the user would like to run the tool for another assessment type or assessment level, another individual assessment must be started, starting from the homepage of LSAT.

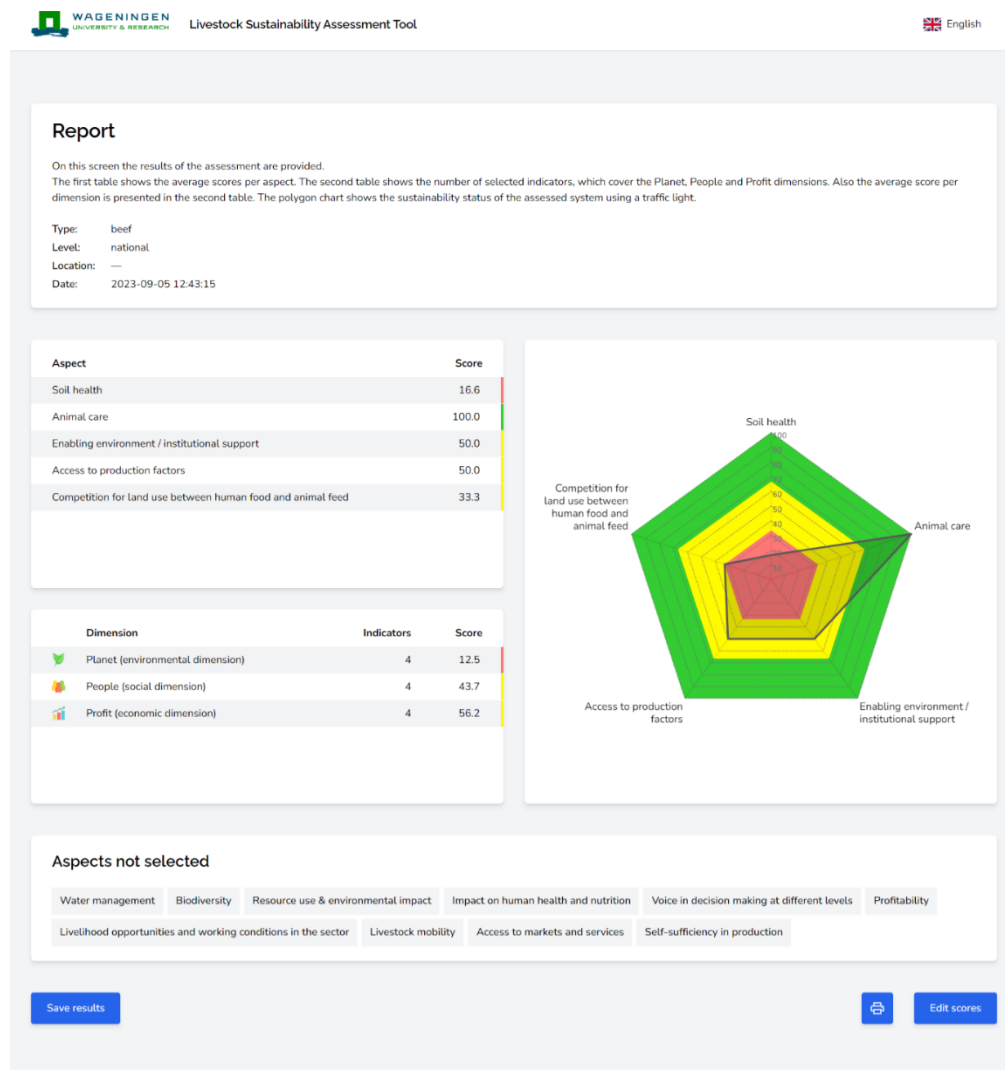


Figure 9: Overview of results

4. Step-by-step explanation of the tool – for group use

INITIAL PAGE (Figure 10)

Please read the general information and instructions on this page.

[Click "Group assessment" to proceed]

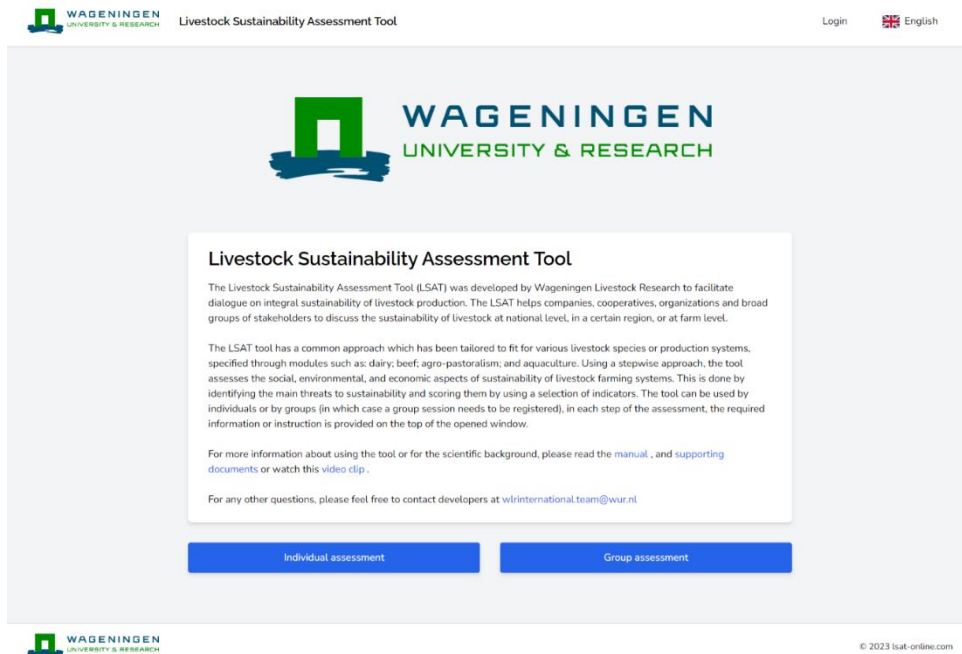


Figure 10: Initial assessment page for group assessment

Enter the code provided by the facilitator and press "Submit" (Figure 11).

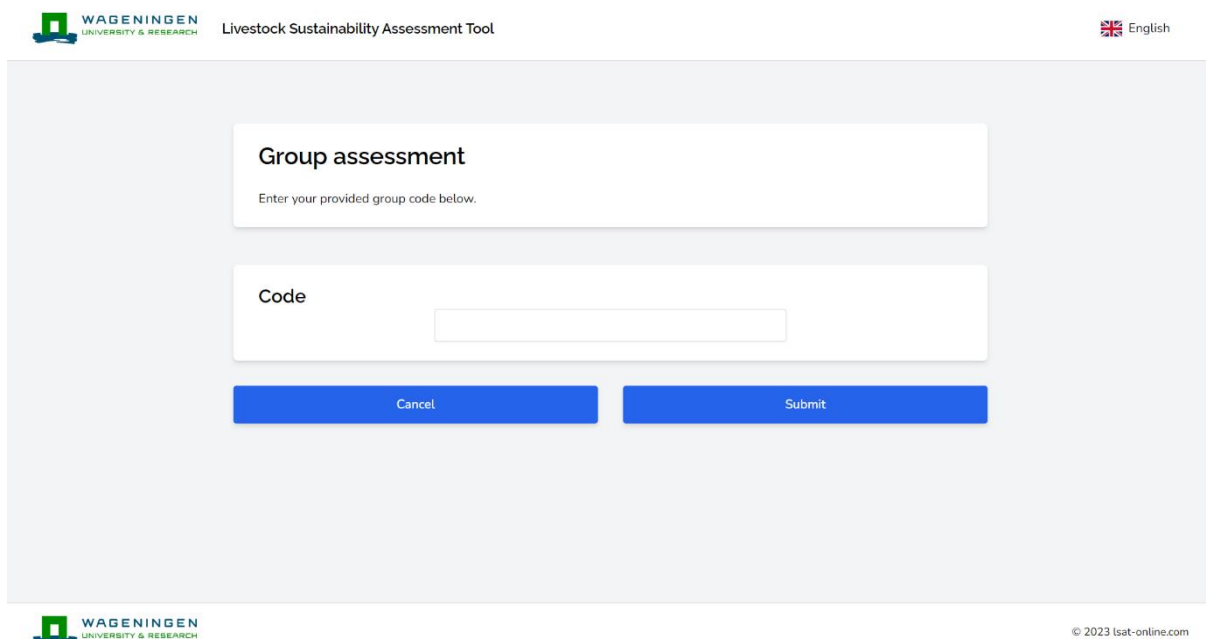


Figure 11: Inserting the assessment code for group assessment

START GROUP ASSESSMENT (Figure 12)

1. User information

- Stakeholder group:** Select the stakeholder group you most closely identify with
- Country:** Fill in the country of the user
- Region:** Fill in the region where the user lives
- Age group:** Select the age-group you belong to
- Education level:** Select the highest level of education that you have completed
- Gender:** Select your gender

2. Assessment: The level of the system to be evaluated will be preselected by the facilitator.

- User identifier:** Everyone in the workshop will receive a personal user identifier from the facilitator, you can enter this description here.

[Click "Next page" button to proceed, or return to previous page by clicking "Previous"]

The screenshot shows the 'Start group assessment' form. At the top left is the Wageningen University & Research logo and the text 'Livestock Sustainability Assessment Tool'. At the top right is a language selector for 'English'. The main form area has a title 'Start group assessment' and a subtitle 'To start a new group assessment please fill the form below.' Below this is a section titled 'User information' with the instruction 'Please fill in your personal information below, according to the characteristics & groups you identify best with.' This section contains six fields: 'Stakeholder group *' (dropdown), 'Country *' (dropdown), 'Region' (text input), 'Age group *' (dropdown), 'Education level *' (dropdown), and 'Gender *' (dropdown). Below the 'User information' section is an 'Assessment' section with a 'User identifier *' text input field. At the bottom of the form are two buttons: a red 'Cancel' button and a blue 'Start assessment' button. The footer of the page includes the Wageningen University & Research logo and the copyright notice '© 2023 lsat-online.com'.

Figure 12: Entering the general information for group assessment

ASPECT SELECTION PAGE (Figure 13)

Select the Aspects that you consider most relevant for sustainability of livestock system/sector and level selected, by clicking in the box next to the Aspect to be selected. At least 3 aspects need to be selected to continue. Recommended number of aspects to be selected is 6 to 8, with an eye to the desired balance

between the people, profit and planet dimensions. Selecting too many aspects runs the risk of losing focus on the key drivers of the system to be analyzed. After pressing the button "Select aspects"

[Click "Select Aspects"]

The screenshot displays the 'Aspect selection' screen of the Livestock Sustainability Assessment Tool. At the top left, the Wageningen University & Research logo and the tool name are visible. At the top right, there is a language selector set to 'English'. The main content area is titled 'Aspect selection' and includes the instruction: 'Select about 7 aspects that reflect the most important sustainability issues for your situation.' Below this is a list of 15 aspects, each with an unchecked checkbox and a downward arrow indicating a dropdown menu. The aspects are: Select all, Soil health, Water management, Biodiversity, Resource use & environmental impact, Animal care, Impact on human health and nutrition, Voice in decision making at different levels, Enabling environment / institutional support, Access to production factors, Profitability, Competition for land use between human food and animal feed, Livelihood opportunities and working conditions in the sector, Access to markets and services, and Self-sufficiency in production. At the bottom of the list are two buttons: a red 'Abort' button and a blue 'Select aspects' button.

Figure 13: Selection of relevant aspects for group assessment

After pressing the button "Select aspects", the page will show "Waiting for facilitator.." (Figure 14). It is the facilitator's turn to lead the group in agreeing on the selection of 6-8 key aspects, i.e. 6-8 areas that show the most prominent sustainability issues. Once the facilitator has selected the chosen aspects to be included in the assessment, the user will be forwarded to the "Indicator selection" page.

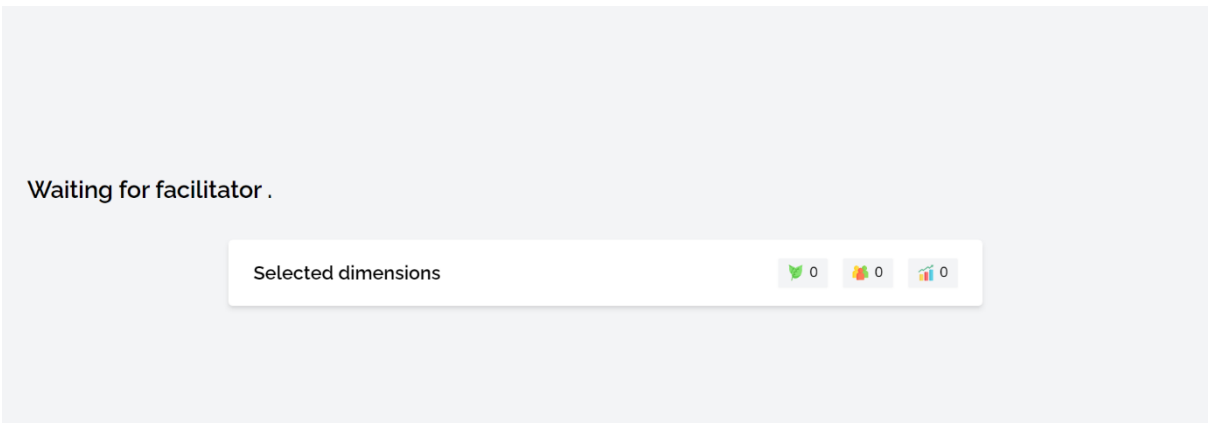


Figure 14: Display screen for intermediary step after selection of aspects

INDICATOR SELECTION (Figure 15)

On the "Indicator selection" page, you are expected to select the indicators most fitting for the local context. In this page you can also see how many indicators for each dimension have been selected, to make sure you keep a good balance.

[Click "Select indicators"]

Indicator selection

Select the indicators that are relevant to be assessed in your situation.

- Planet (environmental dimension)
- People (social dimension)
- Profit (economic dimension)

Selected dimensions

0 0 0

Soil health

Select all

- Soil organic matter
- Soil acidification
- Soil erosion
- Soil compaction

Animal care

Select all

- Animal health

Enabling environment / institutional support

Select all

- Level playing field
- Essential infrastructure services
- Institutions ability to deal with major shocks
- Budget invested in research, extension and education benefiting the sector
- Natural resource governance

Access to production factors

Select all

- Access to credit
- Availability and skill level of household and hired labour
- Feed availability
- Access to land

Competition for land use between human food and animal feed

Select all

- Proportion of land used for forage or grazing that could be used for food crops
- Proportion of cropping encroachment to grazing land

Aspect selection

Select indicators

Figure 15: Selection of indicators

After pressing the button "Select indicators", the page will show "Waiting for facilitator..." (Figure 16). It's the facilitator's turn to make the final selection of indicators that will be scored for the assessment.

Waiting for facilitator ..

Figure 16: Display screen for intermediary step after selection of indicators

SCORING (Figure 17)

Participants are asked to individually score the indicators belonging to the selected aspects. Four scoring options are available per indicator and translated into scores of 1 for red (unsustainable), 2 for orange (not so sustainable), 3 for yellow (quite sustainable) and 4 for green (highly sustainable). After scoring all the selected indicators, press "Confirm" to proceed.

An error message will appear if no or too many scores have been selected.

[Click "Confirm" button to proceed]

WAGENINGEN UNIVERSITY & RESEARCH Livestock Sustainability Assessment Tool English

Scoring

Please assess the selected aspects using the selected indicators. Assessment is performed using four different scoring options, please select the most appropriate answer.

Soil health Animal care Enabling environment / institutional ...

Soil health

Soil organic matter

What is the soil organic matter (SOM) of soils? SOM refers to the organic fraction of the soil exclusive of undecayed plant and animal residues.

- High soil organic matter loss per year
- Medium soil organic matter loss per year
- Low soil organic matter loss per year
- Increase in soil organic matter per year

Soil acidification

What is the pH of the soils? Most crops grow in soils with pH between 6 and 7.5; few plants prefer, however, acid or alkaline soils.

- High rate of acidification (pH dropping quickly)
- Medium rate of acidification
- Low or no acidification
- pH is improving

Indicator selection Next

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Figure 17: Scoring of indicators

REPORTING PAGE (Figure 18)

On this screen the results of the participant's individual assessment are provided:

- The first table shows the average scores per aspect. The second table shows the number of selected indicators, for each of the Planet, People and Profit dimensions, as well as the average score per dimension. The third table lists the aspects that have not been selected
- The radial chart (spiderweb) shows the sustainability status of the assessed system using a traffic light to help users).
 - Red indicates that the measure or goal needs additional attention and resources allocated towards it, to get things on track towards sustainability.
 - Yellow indicates that the measure or goal is close to being on track or might self-correct.
 - Green indicates that everything is on track, i.e. aspect is in sustainable condition.

[Click "Save results" to submit your scores to the facilitator]

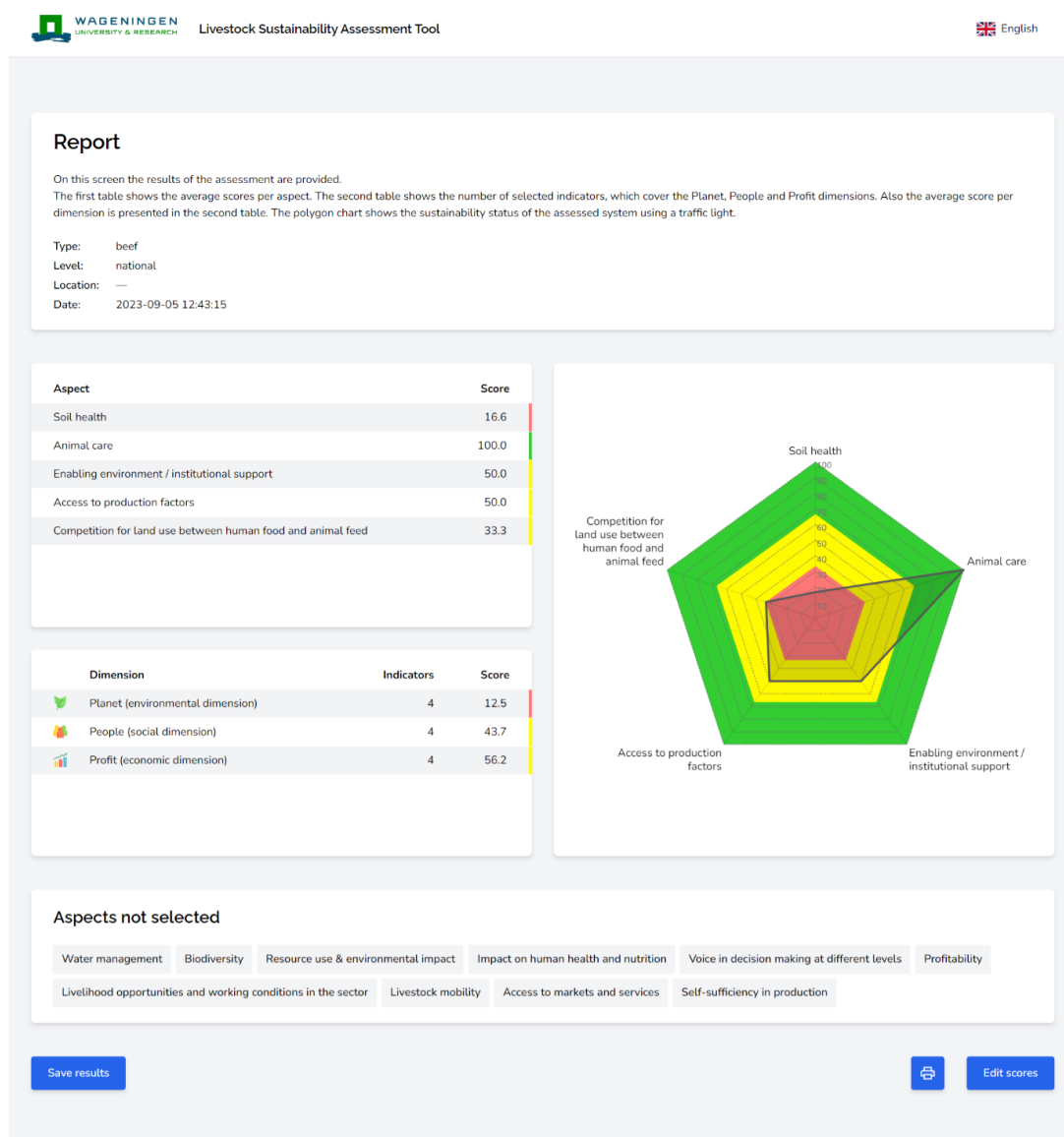


Figure 18: Overview of group results

Once the assessment is finished, please send your results to the facilitator by pressing **"Save results"**. If one would like to edit the scores before submitting them to the facilitator for the group assessment, press **"Edit scores"**.

Of course, reports can also be printed or saved as PDF files.

[Click "End assessment" to return to the homepage of LSAT]

REPORTING PAGE OF THE FACILITATOR

The facilitator collects all the individual assessments submitted by the participants and averages the scores to showcase the group assessment. This report helps the group to review the outcomes: looking at the selection of aspects and the scores provided, does the group agree that:

- **This is an accurate assessment of the sustainability of dairy production and marketing in the case studied?**
- **There is an adequate balance between people, profit, and planet aspects?**

This page reports the results of your assessment in three tables and a polygon figure:

- **The first table lists the selected aspect and the score per aspect, which is the average of the score per selected indicator**
- **The second table summarizes the number of indicators selected per sustainability dimension and aggregates the scores for these indicators into a compound score per sustainability dimension (people-profit-planet)**
- **The third table lists the aspects that have not been selected**
- **The polygon chart visualizes the data from the first table. RYG (red, yellow, green) status indicators are used to help users understand progress toward its own measures and goals.**
 - **Red indicates that the measure or goal needs additional attention and resources allocated toward it, to get things on track towards sustainability.**
 - **Yellow indicates that the measure or goal is close to being on track or might self-correct.**
 - **Green indicates that the aspect is in a sustainable condition.**

During the discussion, the group scores may be edited by the facilitator to incorporate the group's assessment of certain indicators and aspects, thereby creating a final assessment of this specific group for this system type and assessment level.

[Click "Finalize scores" to save the final assessment results]