

WP3

Assessment of the level of alignment of the Sanko Kossam Dairy (SKD) business model with the principles of agroecology using the B-ACT tool



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The CGIAR Initiative Transformational Agroecology across Food, Land, and Water Systems develops and scales agroecological innovations with small-scale farmers and other food system actors in seven low- and middle-income countries. It is one of 32 initiatives of CGIAR, a global research partnership for a food-secure future, dedicated to transforming food, land, and water systems in a climate crisis.

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1 Introduction

In Burkina Faso, consumption of dairy products remains low (around 20 kg/capita/year), but is rising, particularly due to population growth and increasing purchasing power of a part of the population. There is an emerging demand for dairy products made from local milk. More and more consumers want to consume diversified, high-quality dairy products made from fresh milk (liquid milk, yoghurts in a variety of flavors, dégué, gapal, cheese, butter, etc.). However, competition with dairy products made from low-cost imported milk powder is fierce. This is why the stakeholders of the dairy value chain need to innovate at all levels of the agri-food chain to sustainably meet this emerging demand (Duteutre and Vidal 2018).

As part of the Initiative on Agroecology project (AEI), the project team in Burkina Faso is working on the implementation of a "tripartite" Agroecological (AE) Business Model (BM) between the "dairy farmers' organization", "the network of milk collection centers", "and the dairy processors' cooperative" in the town of Bobo-Dioulasso (Sib *et al.*, 2024a ; Sib *et al.*, 2024b).

Laiterie Sanko Kossam (SKD) is a local milk processing unit and a key player in the agroecological transition of Bobo-Dioulasso's dairy value chain. SKD plans to accelerate the development of dairy products based on local milk and natural flavors derived from non-timber forest products, as well as milk-based cosmetics. The dairy receives funds from the "AEI' business model accelerator" (AE BM accelerator). The objective of the AE BM accelerator' is to support small production units with an agroecological vision.

Hence the need to evaluate SKD, to determine its level of alignment on agroecology. If conclusive, this evaluation would enable la SKD to be positioned as a champion agroecological enterprise in the "processor" link of the Bobo-Dioulasso dairy value chain.

The global food system generates around a third of anthropogenic greenhouse gas emissions and is the main driver of biodiversity loss (Rogissart *et al.*, 2019). In this context, the B-ACT (Business Agroecology Criteria Tool) meets the need for a diagnostic tool that takes into account the environmental and social impacts of companies in food systems. This tool identifies companies whose practices are sustainable and have the potential to lead to a sustainable transformation of food systems (<http://www.agroecology-pool.org/tools/>).

Thus, this tool was used to carry out an assessment of the SANKO Kossam dairy's level of alignment with the 13 principles of agroecology described by Wezel *et al* (2020) categorized into 3 pillars of sustainable food systems.

This document presents the B-ACT tool and its application to SKD.

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2 Methodology

2.1 Introducing the B-ACT tool

The Business Agroecology Criteria Tool (B-ACT) assesses a company's overall alignment with the 13 principles of agroecology categorized into 3 pillars of sustainable food systems: (i) the pillar of improving resource efficiency with agroecological principles: Recycling and Reducing Inputs; (ii) the pillar of building resilience with agroecological principles: soil health, animal health, biodiversity, synergy and economic diversification and (iii) the pillar of ensuring social equity with agroecological principles: knowledge co-creation, social values and diets, equity, connectivity, land and resource governance and participation (Figure 1). The tool also contains screening questions to quickly determine whether a company's business model, operations or strategy are potentially in conflict with agroecology. The user can expect to spend 2-3 hours assessing the agroecological character of a company's business model using B-ACT. The B-ACT assessment analysis consists of filling in four main sheets of a Sheets file: (i) 1. About the enterprise ; (ii) 2. Screening questions; (iii) 3. Principle questions and (iv) 4. Impact questions. In the case of this study, we focused on the "3. Principle questions" sheet, as our study company (SKD) was not concerned by the other sheets.

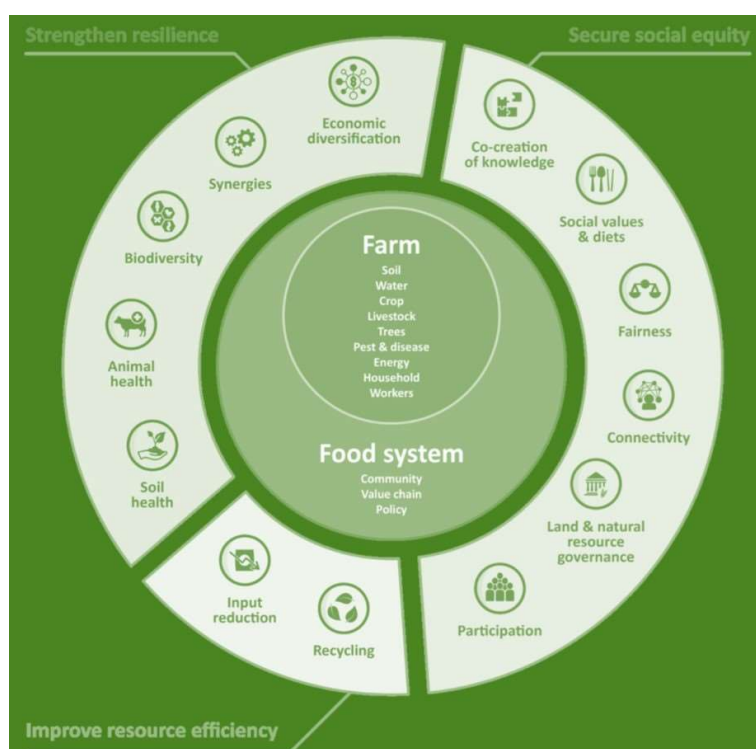


Figure 1. Overview of the 13 principles of agroecology and the three operational pillars of sustainable food systems

The tool calculates an overall agroecological (AE) score for the company. This score is calculated on the basis of the percentage of "Yes" answers to the relevant questions (i.e. excluding irrelevant questions) in

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the "3. Principle questions" tab. The main questions relate to the core activities, processes, approaches or practices undertaken by the organization that are relevant to agroecology. B-ACT also calculates the percentage score per agroecology principle and for each of the 3 pillars of sustainable food systems. Scoring excludes any questions that have been answered "Not Applicable". For example, if there are 10 questions and 9 have been answered "Not applicable", a score of 100% could be obtained by answering "yes" to the only applicable question. The score would be 100%, but the number of questions answered "Not applicable" would be 90%.

2.2 Introducing the Sanko Kossam Dairy

Sanko Kossam Dairy (SKD) was created in 2004 with the primary aim of processing local milk. It is now regularly supplied by five milk collection centers. It began by processing 20 liters of milk a day, then increased its processing capacity to 300 liters a day. The dairy employs 7 permanent staff (4 women in processing and 3 men in distribution). It was registered in 2023 with the Ministry of Commerce under number: RCCM n°: BF-BBD-01-2023-A10-01970. Quality and hygiene control is carried out by the public health services, making it a dairy that complies with hygiene and quality standards. Its products are sold in hospitals, schools, food stores, convenience stores and kiosks, supermarkets, as well as in public and private services and at home (on request). We take part in trade fairs to promote our products.

SKD products include: gapal, plain yoghurt, sweetened yoghurt, skimmed yoghurt, fresh pasteurized milk, fromage frais, pearl millet dêguê, corn dêguê, cream yoghurt, milk drink, curd, cream, Peul cheese (wagashi), butter.

The AE BM accelerator' grant provided by the AEI will strengthen SKD's agroecological practices, enabling the company to exploit new market opportunities. Support from the AE BM accelerator will also benefit the network of milk collection centers and dairy farmers that supply SKD. This will strengthen the entire local dairy value chain in line with agroecological principles. More specifically, the AE BM accelerator will contribute to:

- Increase SKD's processing capacity from 300 to 500 liters of milk per day, using milk produced under agro-ecological conditions; enable diversification of its product range by developing new healthy products based on natural flavors (from non-timber forest products);
- Limiting its environmental footprint while improving its attractiveness and competitiveness on the market, by modernizing its packaging and opting for quality, biodegradable solutions, with labels highlighting the origin of the raw material processed, "local cow's milk";
- Support local dairy farmers in their strategy to increase production by using agroecological techniques to feed cows with locally produced fodder and feed and ;
- Equipping the Yégueresso milk collection center (MCC) with a forage seed and cattle feed distribution system, milk quality control equipment and solar energy to facilitate milk pre-conditioning.

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2.3 Application of the B-ACT tool at Sanko Kossam Dairy (SKD)

Step 1: During a semi-structured interview with the SKD manager, information on the dairy's business model was collected. The dairy was characterized in its entirety (key activities, key partners, key resources, cost structure, value proposition, customer relationships, channels, revenue sources, distribution channels and customer segments).

Step 2: A 4-person research team was set up to answer the questions posed by the B-ACT tool. The team first carried out an analysis of the dairy before the implementation of actions scheduled into the AE BM accelerator, to determine its current level of alignment on agroecology. Then, in a second phase, it carried out an analysis of the dairy alignment on AE principles after the implementation of the actions scheduled into the AE BM accelerator workplan, in order to assess the impact that the AE BM accelerator could have on the dairy's level of alignment on agroecology.

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3 Results

3.1 Assessment of SKD agroecological alignment prior to AE BM accelerator implementation

The SKD, in its current state, has an agroecology score of 49% following the 13 principles of agroecology. The Resource Efficiency Pillar scores 64% higher than the Resilience Building Pillar and the Social Equity Pillar, which score 50% and 40% respectively (Figure 2).

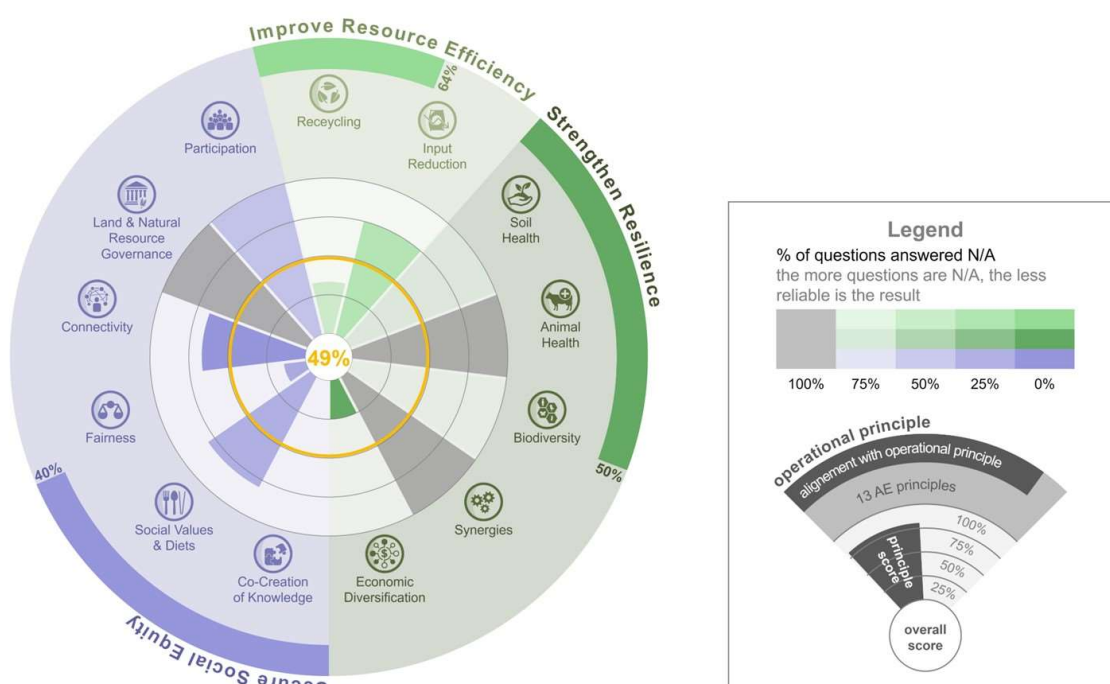


Figure 2. Diagram showing Sanko Kossam Dairy's alignment with the 13 principles of agroecology categorized into the 3 pillars of sustainable food systems prior to the implementation of the AE BM accelerator

In terms of the resource efficiency pillar, SKD's level of alignment with agroecological principles is mainly explained by the implementation of the agroecological principle of input reduction, and slightly less by the principle of recycling (75% and 33.3% respectively).

In terms of the resilience-building pillar, SKD's level of alignment with agroecological principles is mainly explained by the indirect effects of its activity on soil health and biodiversity (the two agroecological principles with which it is most aligned, with scores of 100%). As for economic diversity, it contributes less to its agroecological character, with an alignment score of 25%.

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In terms of the social equity pillar, SKD's level of alignment with the three agroecological principles of participation, social values and diets, and connectivity are 100%, 80% and 66.7% respectively. On the other hand, as things stand, SKD scores less well on the principles of knowledge co-creation and equity, at 0% and 14.3% respectively (Table I).

Table I. Sanko Kossam Dairy's level of alignment with the 13 principles of agroecology categorized into the 3 pillars of sustainable food systems prior to the implementation of the AE BM accelerator

The breakdown of principles that form an agroecological organization	How your enterprise scores per principle based on the information provided	N/A answers are not counted within the percentage
	Percentage	% of Questions answered N/A
Agroecology	48.6%	63.37%
Improve resource efficiency	63.6%	42.11%
Recycling	33.3%	57.14%
Input Reduction	75.0%	33.33%
Strengthen resilience	50%	88.89%
Soil Health	100.0%	87.50%
Animal Health	N/A	100.00%
Biodiversity	100.0%	95.00%
Synergy	N/A	100.00%
Economic Diversification	25%	0.00%
Secure social equity	40%	28.57%
Co-Creation of Knowledge	00%	0.00%
Social Values and Diets	80%	28.57%
Fairness	14.3%	22.22%
Connectivity	66.7%	0.00%
Land and Resource Governance	N/A	100.00%
Participation	100.0%	50.00%

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3.2 Assessment of the SKD's agroecological alignment after implementation of the AE BM accelerator

The implementation of the agroecological accelerator should enable SKD to improve its alignment score with the principles of agroecology. According to the simulation provided by the B-ACT tool, after the implementation of the agroecological accelerator, SKD would present an agroecology score of 96% following the 13 agroecology principles. This improvement in alignment with the principles and pillars of agroecology would be explained by the social equity pillar (which rises to 100%), but also by the pillars of improving resource efficiency and strengthening resilience, which obtain scores of 91.7% and 92.9% respectively (Figure 3).

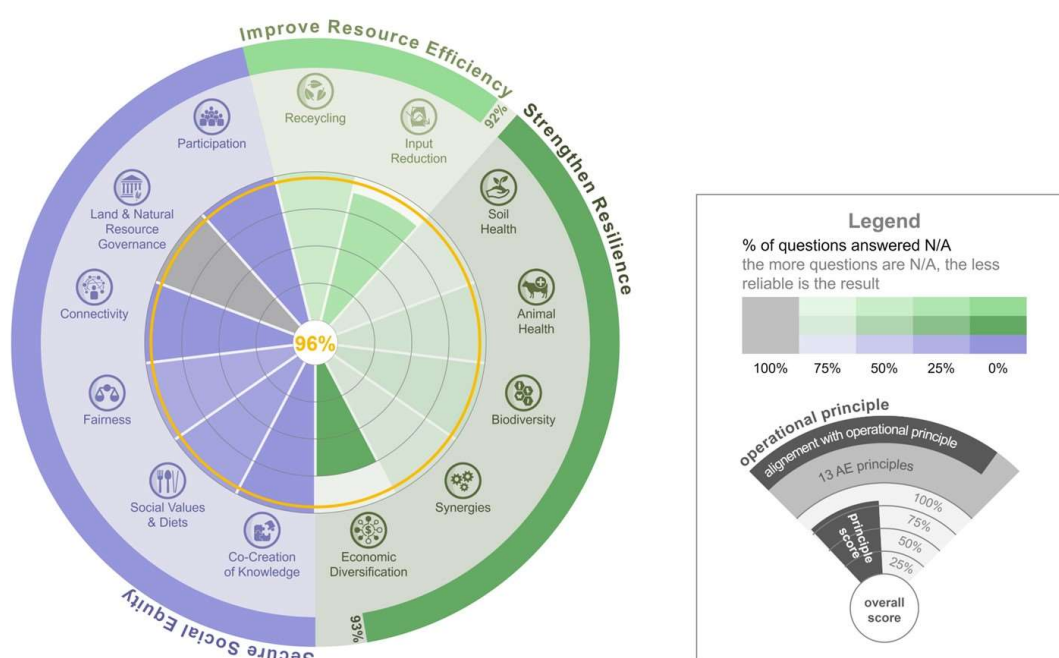


Figure 3. Visualization diagram of Sanko Kossam Dairy's alignment with the 13 principles of agroecology, categorized into the 3 pillars of sustainable food systems, after implementation of the AE BM accelerator

In terms of the resource efficiency pillar, the agroecological accelerator will enable SKD to improve its alignment with the principles of recycling (100%) and input reduction (88.9%).

In terms of the resilience-building pillar, economic diversification will be the only agroecological principle for which the dairy will present an agroecological alignment of less than 100%.

As for the pillar of guaranteeing social equity, the SKD will align itself with all the agroecological principles with scores of 100% (Table II).

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Table II. Sanko Kossam Dairy's level of alignment with the 13 principles of agroecology categorized into the 3 pillars of sustainable food systems after the implementation of the AE BM accelerator

The breakdown of principles that form an agroecological organization	How your enterprise scores per principle based on the information provided	N/A answers are not counted within the percentage
	Percentage	% of Questions answered N/A
Agroecology	95.8%	52.48%
Improve resource efficiency	91.7%	36.84%
Recycling	100.0%	57.14%
Input Reduction	88.9%	25%
Strengthen resilience	92.9%	74.07%
Soil Health	100.0%	87.50%
Animal Health	100.0%	80.00%
Biodiversity	100.0%	75.00%
Synergy	100.0%	83.33%
Economic Diversification	75.0%	0.00%
Secure social equity	100%	21.43%
Co-Creation of Knowledge	100%	0.00%
Social Values and Diets	100%	14.29%
Fairness	100%	22.22%
Connectivity	100%	0.00%
Land and Resource Governance	N/A	100.00%
Participation	100.0%	0%

4 Discussion

The implementation of the agroecological accelerator will enable SKD to move from an alignment level with agroecology principles of 49% to an alignment of 96%. The 3 pillars of sustainable food systems will be positively impacted, with levels of alignment with agroecology principles greater than or equal to 91.7%. This significant increase in the agroecology score is mainly explained by SKD's alignment with the three agroecological principles of the AE business model: animal health, synergy and co-creation of knowledge. SKD's alignment with these principles will also be enabled by services to producers and the strong use of forest products in the diversification of dairy products.

The improvement in resource efficiency (agro-ecological alignment from 64% to 91.7%) will be mainly due to the recycling of whey and other effluents, raising milk producers' awareness of by-product recycling,

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and the acquisition of high-quality, recyclable biodegradable packaging. These practices will significantly change the SKD's alignment with the recycling principle (agro-ecological alignment from 33.3% to 100%).

Improved resilience (agro-ecological alignment up from 50% to 93%) will be achieved by setting up a forage seed bank and feed stores at the Yégueresso milk collection center, which supplies the dairy with milk. Resilience will also be enhanced by the use of no timber forest products as natural flavourings for yoghurts (nééré, kinkéliba, etc.) in local milk processing. The availability of fodder seeds will encourage dairy farmers to cultivate off-season fodder. The SKD dairy will produce and market new healthy products based on the aromas of non-timber forest products and fruit. These practices will improve SKD's alignment with the principle of animal health and synergy. SKD's alignment with the principle of economic diversification will also be strongly impacted (agroecological alignment increasing from 25% to 75%).

The improvement in social equity (agro-ecological alignment from 40% to 100%) will be achieved by promoting the processing of local milk to milk powder processors. The SKD will also be a meeting place for dairy producers. It will support dairy farmers in producing top-quality milk, align its employees' wages with the country's minimum wage, and ensure fair prices with its suppliers (dairy farmers' cooperatives and milk collection centers). These practices will greatly improve SKD's alignment with the principle of knowledge co-creation (AE alignment rising from 00% to 100%) and the principle of equity (agroecological alignment rising from 14.3 to 100%).

5 Study limits

The B-ACT tool is better suited to farms, but its application to a processing plant (such as SKD) has shown its inadequacy, particularly with regard to greenhouse gas emissions, the introduction of GMOs, and farming practices. Thus, 63.37% of questions relating to these subjects were not taken into account during the evaluation before the implementation of the AE BM accelerator and 52.48% of questions after the implementation of the AE BM accelerator. The agroecological principles least taken into account were those of the resilience-building pillar (soil health, animal health, biodiversity, synergy) and the principle of resource and soil governance.

6 Conclusion

The assessment of SKD's level of alignment with the 13 principles of agroecology, categorized into the 3 pillars of sustainable food systems, prior to the implementation of the AE BM accelerator showed a score of 49%. The implementation of the AE BM accelerator should enable it to improve its agroecological alignment score to 96% (Figure 4). The actions planned under the AE BM accelerator therefore appear to have been well chosen to significantly improve SKD's alignment with the principles and pillars of agroecology. The actions that will contribute most to this alignment will be: (i) recycling whey and other dairy effluents; (ii) raising dairy farmers' awareness of by-product recycling; (iii) operationalizing a seed bank with cattle feed to support the Yégueresso milk collection center; (iv) the use of non-timber forest products in local milk processing (as natural flavours); (v) the promotion of local milk processing among

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milk powder processors; and (vi) the consideration of the SKD as a meeting and exchange place for dairy farmers.

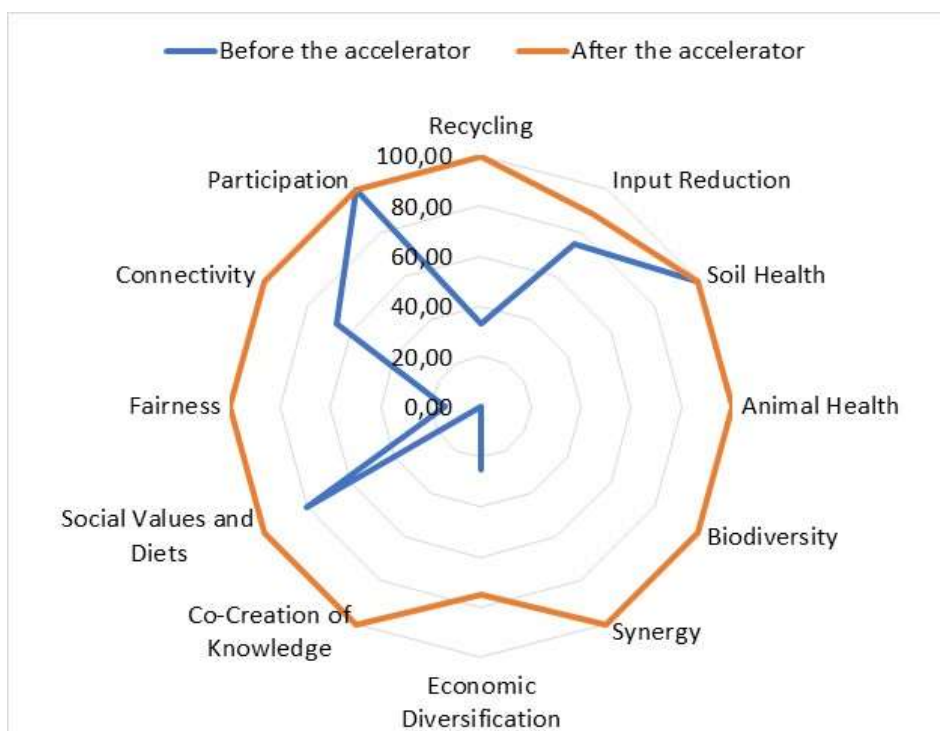


Figure 4. Alignment scores of the Sanko Kossam Dairy with agroecological principles before and after the implementation of the AE BM accelerator

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8 Appendices

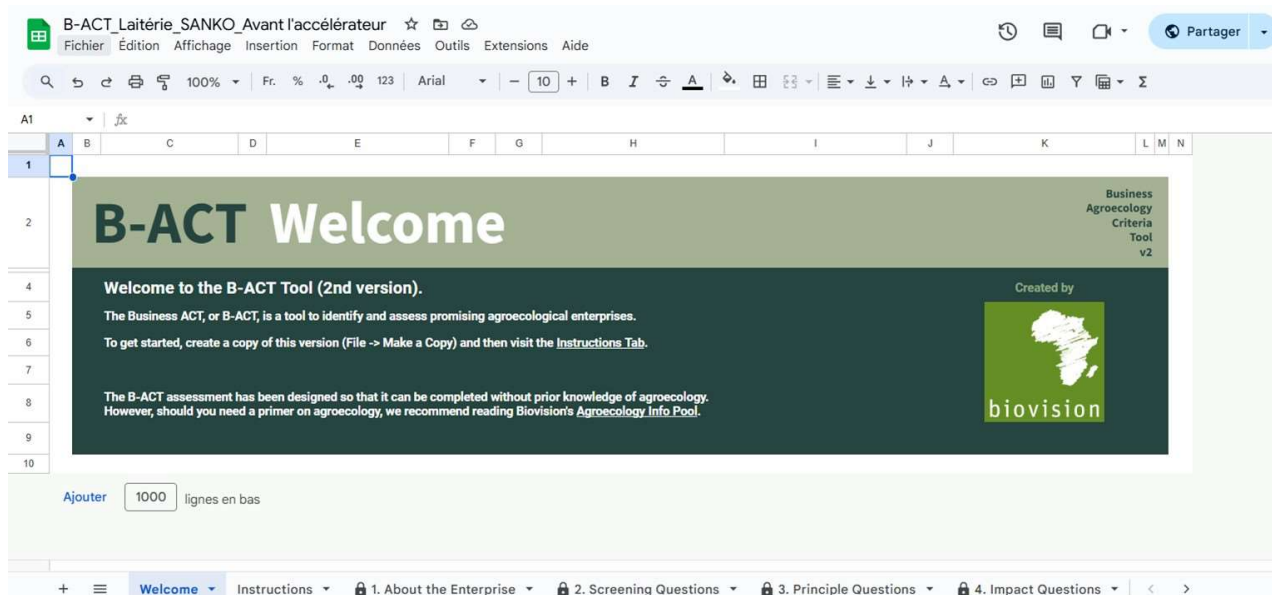


Figure 5 B-ACT home page

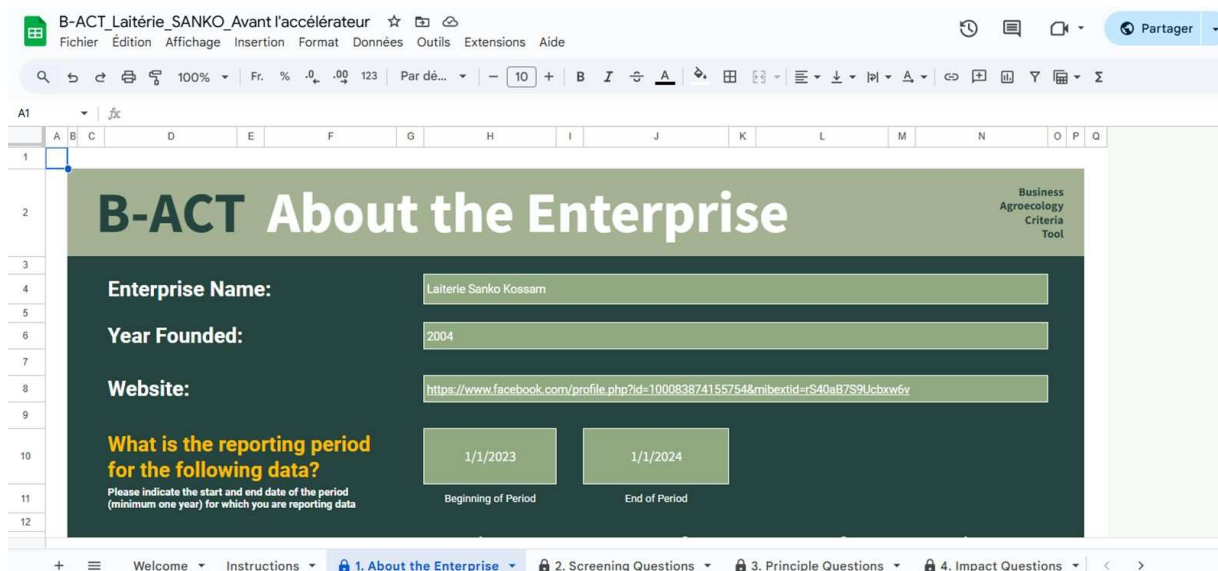


Figure 6. Laiterie Sanko Kossam (SKD) general information page

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Principle	Guiding Questions	Example	Direct	Indirect	Comments
7 Economic Diversification					
Does your business strategy involve the production of or trading in diversified farm products or multiple product lines?	Which products/commodities do you farm/trade/process or source from farmers?	Selling different products to different buyers, sourcing different products from suppliers ...	No	No	
Does your marketing strategy prioritize selling to multiple buyers or market outlets?	How do you incentivize suppliers to produce diversified products?	Selling different products to different buyers, supplying different markets ...	Yes		Various customers
Does your business have multiple revenue streams?	What are the markets and buyers for your products?	Commercializing waste and byproducts, agritourism, on-farm restaurant, payment for ecosystem services, loaning land / machinery ...	No		
8 Co-Creation of Knowledge					
Do you facilitate the sharing and co-production of knowledge between farmers and also with other actors?	In addition to your main business activity / main product line, do you provide other products or services?	Farmer-to-farmer programmes, onfarm research and training approaches, farmer To T model, experiential learning approach, farmer-research networks, farmer field schools, participatory research approaches, community of practice...	No	No	

Figure 7. Page of answers to questions related to the 13 agroecological principles from before the implementation of the AE BM accelerator

Principle	Guiding Questions	Example	Direct	Indirect	Comments
7 Economic Diversification					
Does your business strategy involve the production of or trading in diversified farm products or multiple product lines?	Which products/commodities do you farm/trade/process or source from farmers?	Selling different products to different buyers, sourcing different products from suppliers ...	Yes	No	Production and marketing new
Does your marketing strategy prioritize selling to multiple buyers or market outlets?	How do you incentivize suppliers to produce diversified products?	Selling different products to different buyers, supplying different markets ...	Yes		Various customers
Does your business have multiple revenue streams?	What are the markets and buyers for your products?	Commercializing waste and byproducts, agritourism, on-farm restaurant, payment for ecosystem services, loaning land / machinery ...	Yes		Support MCC of Yéguéresso with
8 Co-Creation of Knowledge					
Do you facilitate the sharing and co-production of knowledge between farmers and also with other actors?	In addition to your main business activity / main product line, do you provide other products or services?	Farmer-to-farmer programmes, onfarm research and training approaches, farmer To T model, experiential learning approach, farmer-research networks, farmer field schools, participatory research approaches, community of practice...	Yes	Yes	promoting local milk p

Figure 8. Page of answers to questions related to the 13 agroecological principles after the implementation of the AE BM accelerator

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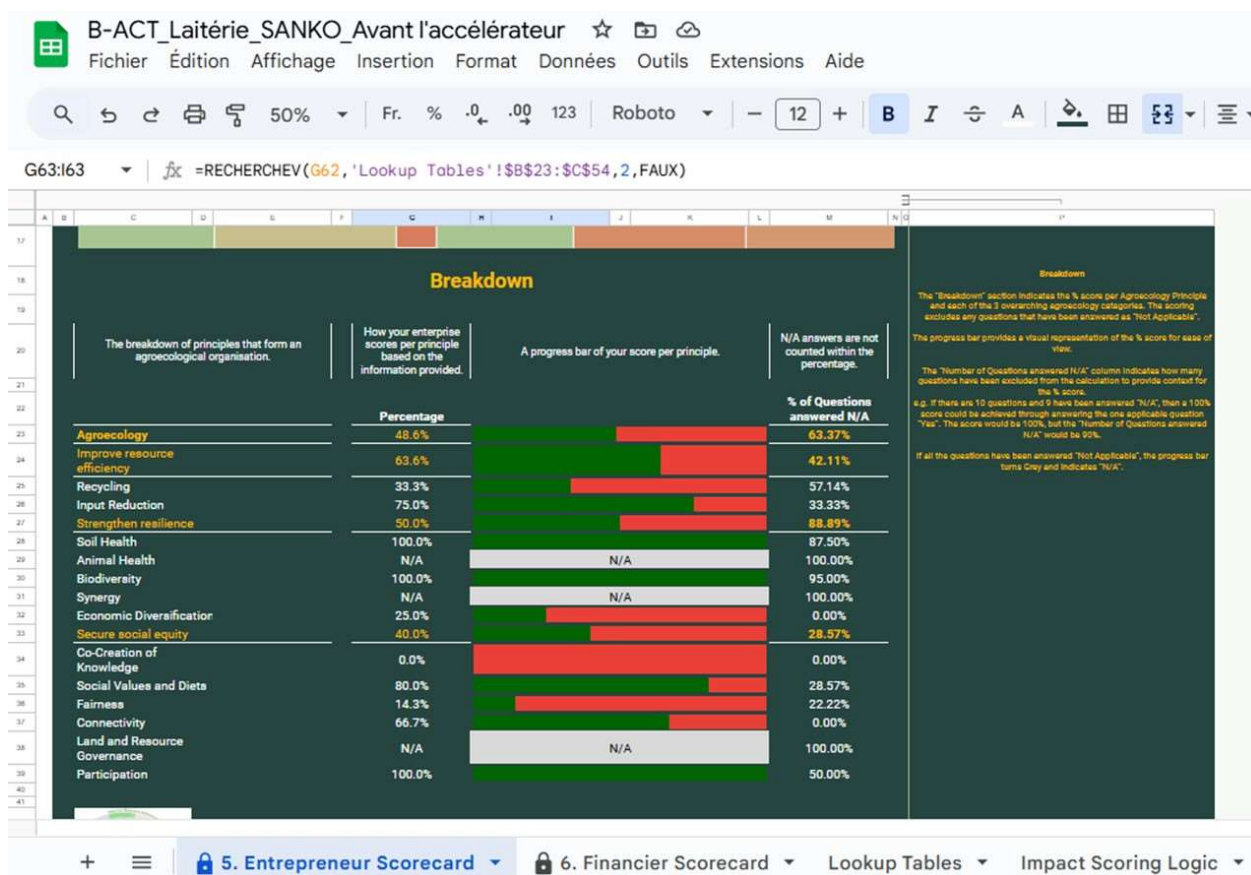


Figure 9. Page presenting the agroecological scores of the SKD alignment according to the 13 principles of agroecology categorized into the 3 pillars of sustainable food systems prior to the implementation of the AE BM accelerator

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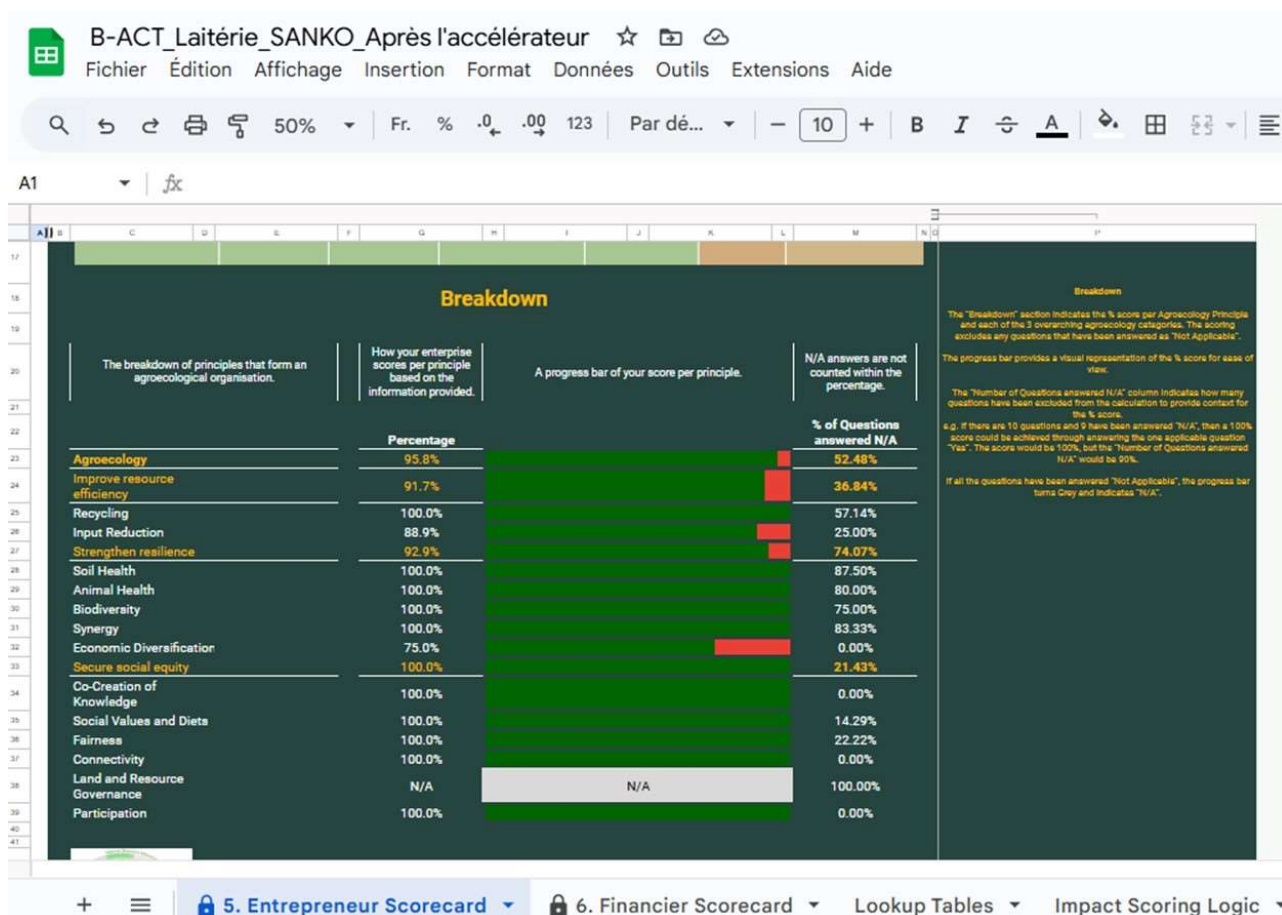


Figure 10. Page presenting the agroecological scores of the SKD alignment with the 13 principles of agroecology, categorized into the 3 pillars of sustainable food systems, following the implementation of the AE BM accelerator

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Principle-Chart Illustrator

1. B-ACT:

1. Fill out the "2. Principle Questions" tab in the B-ACT.
2. Go to the "5. Entrepreneur Scorecard" tab and select "File" >> "Download" >> "Tab-separated values (.tsv)".

2. On this site below:

1. Click on the "Upload File" button and choose the previously downloaded file.
2. Click "EN", "FR" or "DE" to create the illustration of the enterprise's alignment with the 13 principles of agroecology and the 3 operational principles of sustainable food systems in the respective language.
3. By hovering the mouse over the principle, more details on the score appear.
4. "Download jpg" allows to download the chart into your download folder.



Upload File

EN

FR

DE

Download jpg

Figure 11. Construction page of the SKD alignment visualization diagram following the 13 principles of agroecology categorized into the 3 pillars of sustainable food systems