Working Document

Work Package 1

Co-designing an agroecological package with the actors of the Burkina Faso Agroecological Living Landscape

Bobo-Dioulasso, CIRDES, May 11, 2023

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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. www.cgiar.org/initiative/31-transformational-agroecology-across-food-land-and-water-systems/

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1 Introduction

On Thursday, May 11, 2023, a workshop was held in the training room of the Centre International de Recherche-Développement sur l'Élevage en zone Subhumide (CIRDES) to co-design an Agroecological package with the Agroecologicel Living Landscape (ALL) actors as part of the Agroecology Initiative project (agroecology to transform water and land management and the sustainability of food systems). This workshop follows the launch of the Agroecology Initiative with the Dairy Innovation Platform of Bobo-Dioulasso on March 28, 29 and 30, 2023 at CIRDES. The launch of the initiative consisted in presenting the Dairy Innovation Platform (DIP) and the Agroecology Initiative project, followed by the positioning of stakeholders in the DIP and in the project, as well as the formalization of the Agroecological Living Landscape (ALL). The aim of the was to adjust and validate the agroecological package protocols (fodder demo-plot, balanced ration, manure pit) with volunteers farmes.

The workshop focused on the following main points:

- presentation of the agroecological package (fodder demo-plot, manure pit, advisory tools);
- discussions: protocol adjustment and validation;
- presentation and validation of next steps.

This report summarizes the work carried out during the workshop.

2 Workshop sequence

The work was carried out in plenary sessions, with presentations followed by discussions, at the end of which suggestions were made and a draft of the producer-research commitment and the experimentation plan were handed over to the MCC representatives.

The agro-ecological package will be tested with 54 volunteer producers from nine (09) MCC (6 producers/MCC).

2.1 Presentation of the agroecological package

- **Fodder demo-plot**

Milk collection centers (MCC) will select volunteer farmers (known as "mothers") who will commit themselves in year N to setting up a basic agronomic system called a Demo Plot (DP). The Demo Plot consists of planting two legumes (*Mucuna deeringiana and Forage cowpea KVX-745-11P)*. The DP will be installed by the volunteer grower in year N (2023) on a plot of 0.125 ha/variety, of which 2/3 of the plot/variety area will be reserved for his fodder needs and 1/3 of the area for seed production. The seed produced will be divided into three equal parts: one part will be used to replicate the DP in year N+1 (2024) and the other two parts will be given free of charge to voluntary neighbors (known as "daughters") to implement the PD on their farms in 2024 (year N+1). The fodder produced will be stored and well preserved. Technical and socio-economic monitoring of the DPs and the farmers' milk production workshops will be carried out.

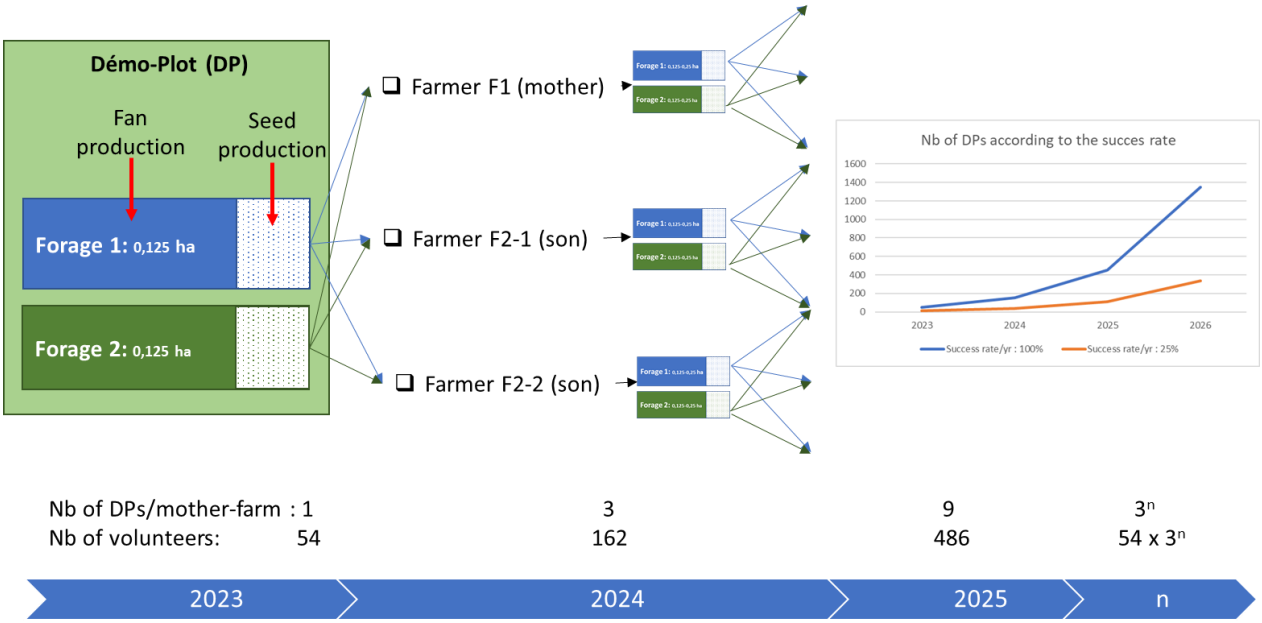

Figure 1: Demo Plots experimental diagram

- **Advisory on co-product management and dairy cows' diets**

The CoPropScope tool will be use to co-desing smart management strategies of crop-livestock co-product at the farm level with the volunteer farmers in order to produce sufficient fodder stocks, enough manure, and maintaining mulch on soil.

The Jabnde tool is an Excel spreadsheet containing numerous calculation sheets that calculates individual balanced dairy cows diets according to the characteristics of each animal (sex, age, physiological state, etc.), which differentiates it from most software packages that reason on the basis of the average animal in a batch. The Jabnde tool will be used to provide technical, economic and environmental advice on the rational feeding of dairy cows. The work will be carried out on the dairy production units of volunteer dairy farmers who have set up a DP. The aim will be to set up efficient dry-season rations, i.e. those that are balanced, technically effective, economically profitable and emit less CH4.

- **Manure pit**

With a view to better recycling of crop-livestock co-products, covered manure pits will be installed to produce high-quality organic manure for fertilizing forage plots and other crops. The manure pits will be covered to limit the production of greenhouse gases (GHGs), in particular nitrous oxide (NO2). The manure pits to be built will measure 3m*3m*1m, i.e. a volume of $9m^3$. To set up and maintain the manure pits, each producer involved will be provided with 3 bags of cement (150 kg), 01 tarpaulin (9 m^2) and technical data sheets (for manure pit construction and organic manure production).

2.2 Discussions: protocol adjustment and validation

At the end of the discussions, the following points were retained:

- The Fodder demo-plot principle has been accepted and validated by the producers;
- A total of 54 dairy farmers will be identified, with 6 dairy farmers in each of the nine (09) MCCs of the DIP;
- The principle of two legumes (*Mucuna and Cowpea*) is accepted, but with the possibility of adding grinkan sorghum and forage maize at the grower's request. These seeds will be given to growers free of charge. However, growers remain concerned about the viability and productivity of the "improved" seed over the 3 years of experimentation. It was suggested that after three years, they consider reintroducing basic seed, particularly for improved varieties, to remedy the low seed quality.
- The principle of installing covered manure pits was accepted. However, there was a slight reluctance to have the manure pits built, as this is the responsibility of the producer.

2.3 Suggestions and prospects

Producers put forward suggestions for the success of the agroecological package activities to be implemented. These included:

- Enable certain producers (farmers who do not necessarily produce milk, forage producers, etc.) to benefit from the project's support to develop a forage production activity.

- Provide support in obtaining cultivation areas;
- Make it easier to obtain mowing and feed weighing equipment;
- Support producers in obtaining on-farm water sources.

2.4 Presentation and validation of next steps

Following the presentation of the agro-ecological package (DemoPlot, Manure pit, using tools to deliver smart advisory to farmers) and discussions on the adjustment and validation of the protocol, a draft of the producer-researcher commitment and the experimentation diagram were given to the MCC representatives. The nine (09) MCCs representatives undertook to pass on the points discussed at the workshop to their respective members, to identify six (06) volunteer producers from among their MCC members who would be able to implement the agroecological package, and to provide feedback to the consortium. Following this, a team of researchers will plan visits to each MCC to provide training, seed distribution and manure pit construction equipment.

3 Conclusion

At the end of the co-design day, all the producers validated the three elements of the agroecological package (fodder demo-plot, manure pit and use of tools). They also undertook to identify volunteer farmers from their MCC to implement the agroecological package. Finally, the participants were thanked for their effective participation and for the quality of their presentations, which augured well for the success of the activities.

4 Appendices

Appendix 1: DRAFT COMMITMENT PRODUCER - RESEARCH

As part of the Agroecological Living Landscape (ALL) around the Bobo-Dioulasso dairy value chain, an agroecological package consisting of : DemoPlot, covered manure pit, and co-design of balanced ration, is offered to volunteer producers.

Experimental approach :

A. A volunteer dairy farmer undertakes to install a **Demo Plot** (DP) in year N (2023), a forage composed of 2 forage varieties on an area X (0,125 ha/forage), of which 2/3*X is for his own forage needs (cutting/drying/storing and using the harvested forage for his dairy cows) and 1/3*X ha/variety for seed production (keeping 1/3 of the seed to replicate the DP in year N+1 (2024), then transferring the remaining 2/3 free of charge to willing neighbors (known as "daughters") to replicate the DP on their farms in year N+1).

B. The volunteer farmer harvests and stores the forage, then works with the research team to develop **balanced rations** based on the forage, using the Jabnde tool.
C. The voluntary farmer installs a **manure pit** next to the dairy workshop to produce quality organic manure to fertilize his forage plots.

1. **The consortium (CIRAD, CIRDES and INERA) undertakes to :**

   Supply forage cowpea seed, variety KVX 754-11-P/TEEK-SONGO, *Mucuna deeringiana* and Grinkan sorghum and/or Espoir maize to Mr. ..... breeder, dairy nucleus holder CNIB N°: ..... village/MCC: ..... and ITK data sheets for these forage varieties.

   ✓ Support farmers in developing balanced rations.
   ✓ Supply 3 bags of cement, 9 m of tarpaulin, pit construction plans and instructions for filling the manure pit. Provide training on the technical itineraries of the entire agroecological package.
   ✓ Keep track of the entire package.
   ✓ Evaluate results year after year.

2. **The producer member of a milk collection center (MCC) thus designated undertakes to** :

   ✓ Implementing the agro-ecological package
   ✓ Make a plot available for setting up Demo plots (DP) following the experimental approach Replicate the DP in year N+1 with 1/3 of the seed produced Transfer 2/3 of the seed free of charge to volunteer neighbors (known as "daughters") to replicate the DP on their farms in year N+1.

- ✓ Harvest and store forage.
- ✓ Develop rations with the support of researchers.
- ✓ Build the manure pit using cement and following the instructions provided by the researchers.
- ✓ Fill the pit according to the indications provided by the researchers.
- ✓ Provide information on the operation of your business.
- ✓ Authorize monitoring (visits and observations) of the trial set up.
- ✓ Agree to the use of the data.

The Producer **Representative of the Consortium (CIRAD, CIRDES, INERA)**

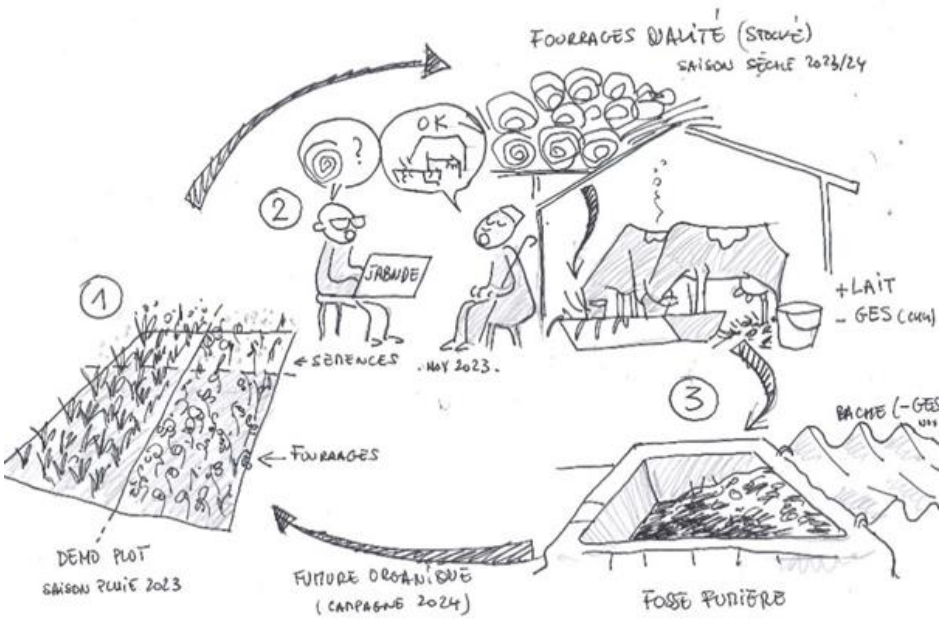

Figure: Diagram of the Ae package to be tested by volunteers