



INITIATIVE ON
Agroecology



Dynamic for the agroecological transition (Dytael) in Fatick - Senegal

Relocalization of the millet value chain for the
territorialization of agroecology



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*Analysis of the level of
agro-ecological transition,
profitability, obstacles and levers
Jamm Bugum's integrated value
chain business models*

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I. Introduction

Senegal's socioeconomic framework, developed in 2014, was designed before the emergence of the Sustainable Development Goals (SDGs). As a result, sustainable development and agroecology were not explicitly integrated into its strategic objectives. This planning document, called the Emerging Senegal Plan (PSE), has however evolved to adopt a more ecological vision thanks to advocacy efforts and the dynamics of the agroecological transition that has emerged in Senegal. The PSE has thus been enriched and renamed PSE_vert, marking the integration of agroecology into national policies.

The involvement of agroecology in public policies is now strong at the national level. However, at the local level, the dynamic remains insufficient and local policies continue to leave limited, or even negligible, space for agroecology.

In this context, local initiatives such as the Dytael of Fatick have set themselves the objective of territorializing agroecology. Chosen as an Agroecology Living Landscape (ALL), this initiative benefits from the support of the One CGIARE agroecological initiative, which aims to promote a voluntary and responsible adoption of agroecology in local development policies. Thus, in many municipalities making up the ALL, such as Niakhar, agroecology is now integrated into municipal development policies (PDC).

To operationalize these PDCs, the municipalities rely on local initiatives and highlight actions in favor of agroecology. The municipality of Niakhar, which hosts the Jamm association Bugum (currently in charge of the secretariat and leadership of Dytael), relies on the activities of this association to advance the agroecological transition.

Jamm Bugum works towards the territorialization of local value chains, particularly that of millet, by developing an integrated value chain. The association promotes the valorization of local products through two main axes: the creation of units for processing millet into derivative products such as couscous and Thiakry, very popular in Senegal, and the production of composite bread that substitutes wheat with 30% of locally produced millet. In addition, Jamm Bugum supports the agroecological transition of local millet production and offers commercial opportunities, thus placing its action in a broader vision of valorizing local value chains. As leader of the ALL, Jamm Bugum wants to make its integrated value chain model a showcase for the promotion of agroecology in the Fatick department.

1. Introduction

The One CGIAR agroecology initiative, which has been supporting the association for two years as part of its component dedicated to agroecological value chains and economic models, shares in this document the results of the diagnosis of the level of agroecological transition, profitability, as well as the obstacles and levers linked to this integrated value chain model. The study was based on a rigorous methodology, using diagnostic tools such as the B- act Tool to analyze the level of agroecological transition, the benefit-cost ratio to evaluate profitability, and the SWOT analysis to identify the obstacles and levers.

2. Methodology

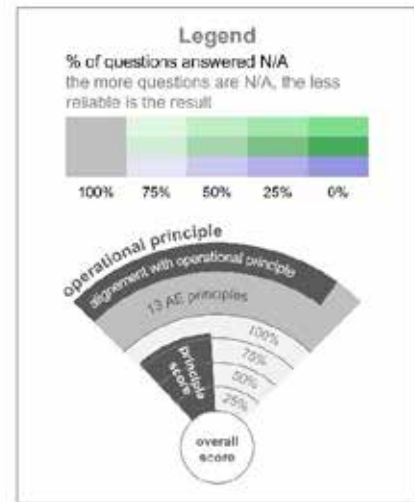
The methodology is based on five points, namely the presentation of the Jamm association Bugum , the review of the mapping of the millet sector and the market situation at national and local level and the diagnostic phase itself mobilizing the B- act tools Tool , RCB and SWOT analysis.

The diagnosis was made in a participatory manner with the actors (production and transformation) of the millet value chain of Jamm Bugum . For each link, ten people were invited to the participatory workshops for a day of work in the B- act tool. Tool was mobilized followed by RBC and SWOT.

2.1. *B act: Business Agroecology Criteria Tool*

The B- act tool Tool, developed by Biovision, is a multi-criteria analysis tool designed to assess the level of alignment of business models with the 13 principles of agroecology defined by the HLPE in its 2019 report. To facilitate its use, these principles have been grouped into three operational categories. The first, focused on efficiency in the use of resources, includes principles 1 and 2, relating to recycling and reduction of inputs. The second, focused on resilience, covers principles 3 to 7, which concern soil health (soil health), animal health , biodiversity , synergies and economic diversification. Finally, the third category, entitled social security and equity, encompasses principles 8 to 13, relating to knowledge, social values , fairness , connectivity , governance and participation

2.1. *B act: Business Agroecology Criteria Tool*

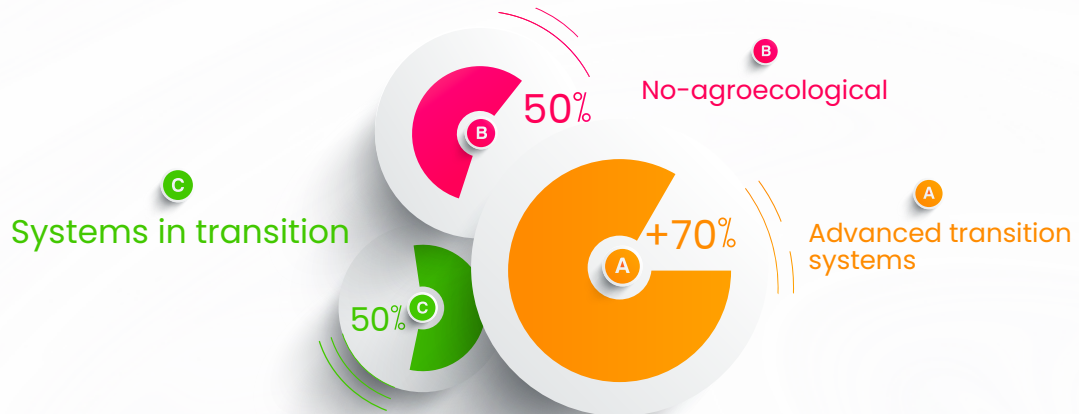


The assessment is based on a qualitative analysis of the sub-criteria used to inform the principles. It is carried out at two levels: on the one hand, directly, to assess the behavior of the activities of the business model, and on the other hand, indirectly, to determine the influence of the business model on the activities of its suppliers. For each criterion and at each level, the business model can respond in three ways: Yes, No or NA (Not Applicable). The frequency of positive and negative responses makes it possible to calculate aggregated scores progressively, first at the level of the 13 principles taken individually, then at the level of the operational principles.



2.1. *B act: Business Agroecology Criteria Tool*

To facilitate the reading of the results, the focus is on the operational principles and we used the FAO analysis grid developed in the TAPE tool based on the 10 elements of agroecology which constitute a condensed form of the 13 principles



Before starting the evaluations, a harmonization of understanding was carried out within the team. Then, this harmonization was extended to all stakeholders, including the evaluation team (researchers) and the bearers of the economic models.

2.2. *Cost benefit report and SWOT analysis*

The benefit-cost ratio was analyzed over a five-year period (2019-2023) for each business model. Production costs, including investments and working capital, were determined for each model, as well as the profits made at the end of each financial year. A business model is considered profitable when its benefit-cost ratio is greater than 1.

As for the SWOT analysis, it is based on the evaluation of the level of agroecological transition and profitability, as well as on a diagnosis carried out using problem and objective trees, in order to identify the obstacles and levers for action allowing an agroecological intensification of economic models.



3. Presentation of the Jamm association Bugum, carrier of integrated value chain



Initially created to promote the socio-cultural development of young people, the Jamm association Bugum has gradually diversified its activities in order to meet the many challenges facing this population. This repositioning has resulted in the development of income-generating activities, by promoting the specific potential of the region, particularly in the agricultural sector.

Jamm 's initiatives Bugum , millet cultivation has established itself as a specialty. Faced with global socio-economic and climatic upheavals, the year 2015, marked by the adoption of the Sustainable Development Goals (SDGs), was a major turning point for the association. That same year, Senegal was designated by the FAO as a pilot country for agroecology in West Africa. Jamm Bugum then committed to sustainable and environmentally friendly agriculture, consolidating its role in the resilience of local communities.

The association has focused its strategy on:

- **Quality production , based on better control of production factors** (in particular climate information) , networking with Microfinance Institutions , reduction of chemical inputs and connection to niche markets, such as agri-food groups or large national markets;
- **A rigorous quality approach , imposed by these demanding markets.**

However, Jamm Bugum found that the export of raw materials (local production of millet) generated a loss of earnings in terms of impact on local employment, food self-sufficiency and income at the territorial level.

In 2022, in the face of health (Covid-19) and geopolitical (Russo-Ukrainian war) crises, the association committed to the relocation of millet value chains to strengthen the creation of added value at the local level. This initiative led to the creation of an Economic Interest Group (GIE), aimed at intervening in several links of the millet value chain, in particular:

- **The production of the product;**
- **Storage and linking;**
- **Transformation, with the opening of a bakery and a local cereal processing unit.**

The bakery, spearheading this transformation, produces an innovative bread incorporating 30% millet as a substitute for wheat, a product mainly imported into Senegal. In addition, the processing unit has specialized in locally popular derivative products, such as couscous and Thiakry.

3. Presentation of the Jamm association Bugum, carrier of integrated value chain ———

To ensure optimum quality, the association has trained its members in modern bread-making and food processing techniques and technologies, in collaboration with the Institut de Transformation Agroalimentaire (ITA) of Senegal.

These achievements in sustainable agriculture and the development of local value chains have earned the association the choice to lead the Local Dynamics for Agroecological Transition (DyTAEL) of the Fatick department, created in 2022 and affiliated with the national dynamic (DyTAES).

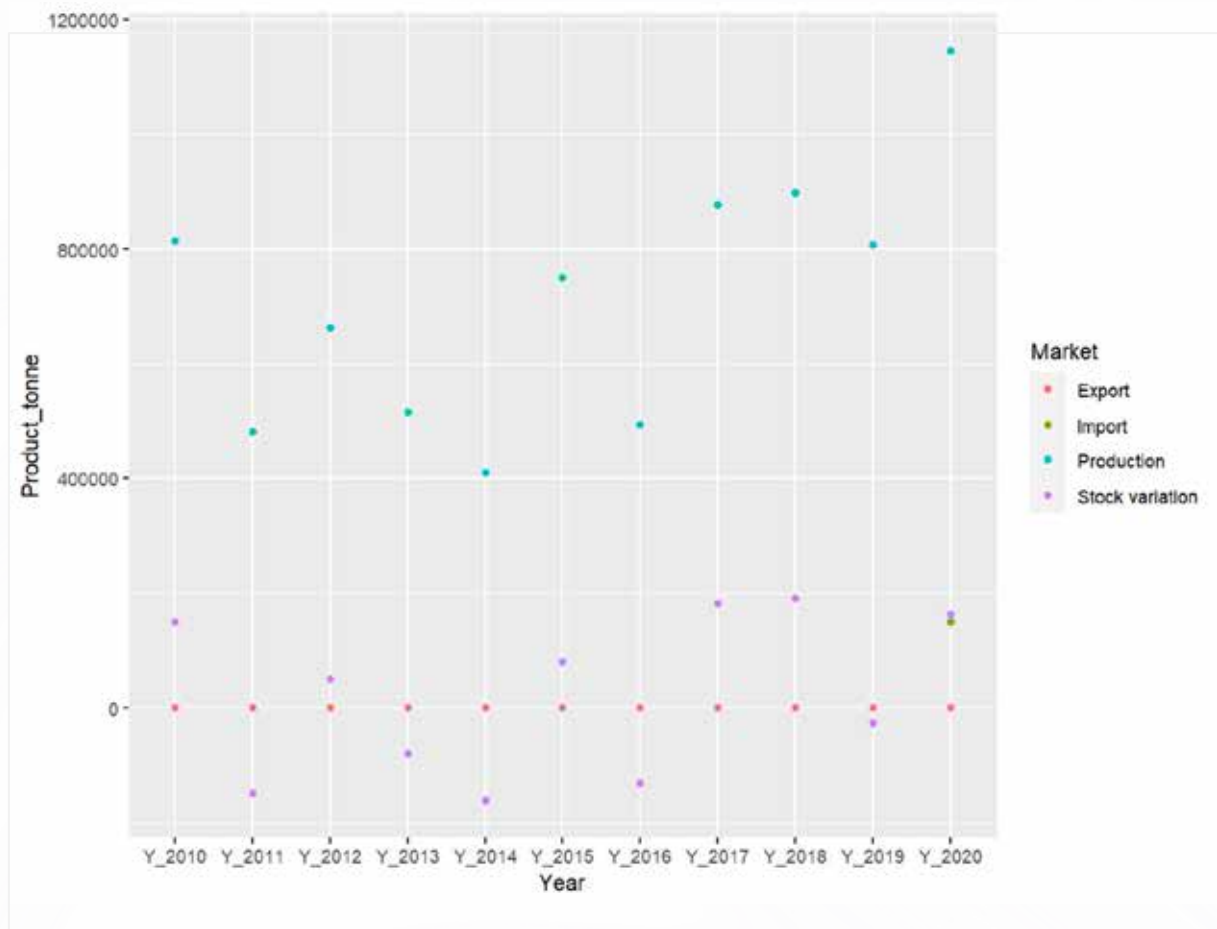
This initiative aims to make Fatick an agroecological department by 2035, with indicators measuring progress according to the 13 HLPE principles of agroecology. Jamm Bugum aims to strengthen the agroecological intensification initiated since 2015, thus demonstrating the positive impacts of this approach on the local economy, food security and the resilience of territories.

4. The importance of millet on household consumption

Millet, after rice, is the second most consumed cereal in Senegal, with an average of 30.2 kg/person/year. Consumption is higher in rural areas, with an average of 53.3 kg/person/year compared with 23.1 kg/person/year.

National millet consumption is supported by local production exceeding 700,000 tonnes per year, with peaks reaching 1,200,000 tonnes and, at other times, 400,000 tonnes. In the event of a stock deficit, this consumption is offset by imports of substitute products such as rice and wheat. On the other hand, during surplus years, the surplus millet is exported. This illustrates the existence of obstacles to be overcome in order to increase the place of millet in household consumption, to the detriment of imported cereals.

4. The importance of millet on household consumption



5. The local millet market

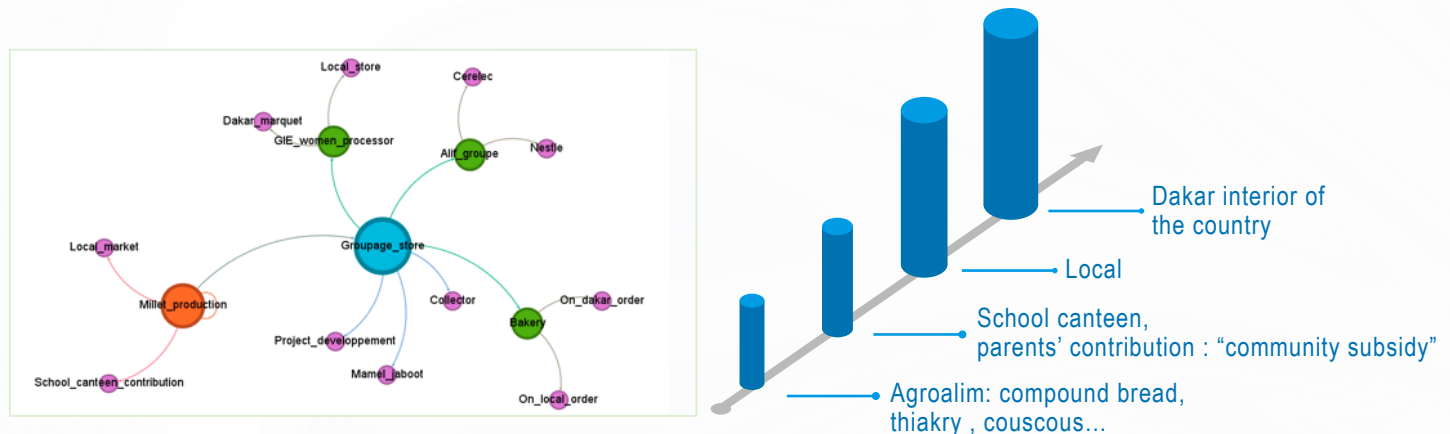
Millet produced by Jamm producers Bugum has four market outlets, apart from self-consumption which is the most important part. Millet is mainly marketed in Dakar – capital of Senegal – to agri-food companies for raw material. To a lesser extent, it is marketed as a raw product at the local market. Parent producers also support in kind school canteens which are based on local consumption where millet is consumed with local milk. To a very small extent, millet is transformed locally into millet-derived products (coucous, thiackri, etc.) but also into compound bread with a substitution of wheat by millet up to 30%.

The aim in the territorialization of agroecology through the relocation of value chains seeks to orient the market towards the local processing of millet for more added value, income and employment. Also develop agroecology products with a view to providing school canteens with healthy products. The expansion of canteens can also serve as a lever for action for the advance promotion of millet consumption, allowing to break the barriers around the preferential consumption of imported cereals.

5. The local millet market

Millet produced by Jamm members Bugum has four main outlets, in addition to self-consumption, which remains the dominant share. A large part of the production is marketed in Dakar, the capital of Senegal, to agri-food companies that use it as a raw material. A smaller proportion is sold in raw form on local markets. In addition, producers who are also parents of students support school canteens by contributing in kind. These canteens, focused on local consumption, use millet in combination with local milk. A very small part of the millet is processed locally into derivative products (such as couscous or thiakry) or incorporated into composite bread, with millet substituting wheat for 30%.

The objective of the territorialization of agroecology, through the relocation of value chains, is to further orient the market towards the local processing of millet. This approach aims to generate more added value, income and jobs. It also aims to develop agroecological products to supply school canteens with healthy foods. The expansion of school canteens could thus serve as a lever to further promote millet consumption, while overcoming the obstacles linked to the current preference for imported cereals.



Jamm Bugum follows the logic of the internal value chain by positioning itself on different links allowing vertical relationships between producers and processing units, whether that of women processors with the diversification of products or bakery for the substitution of wheat with millet in particular.

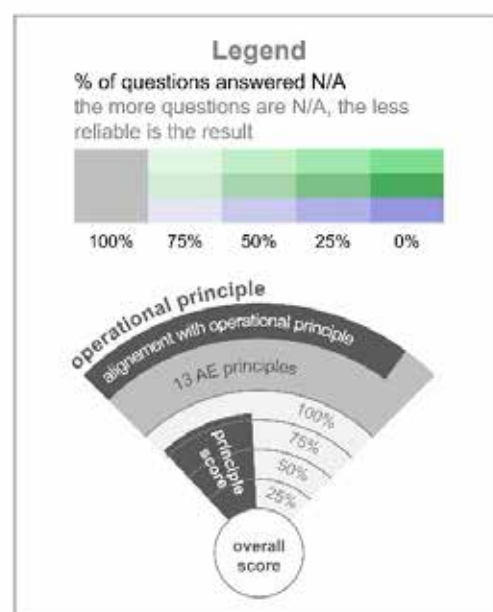
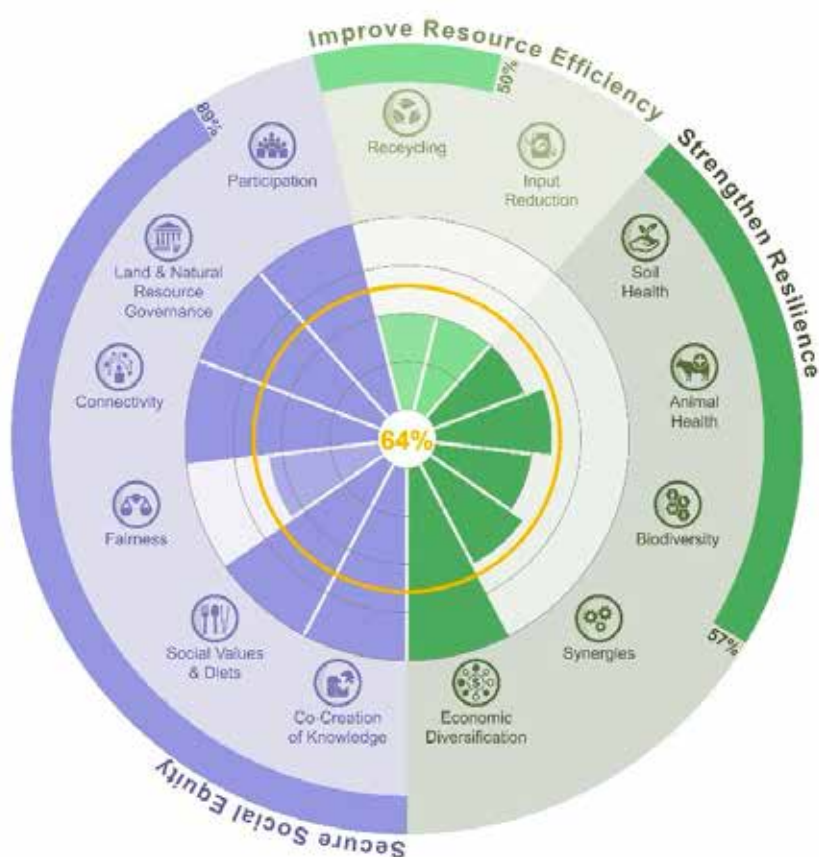
In line with its leading position on Dytael , these relationships are built on the desire to align with the principles of agroecology.

6. Analysis of the level of alignment with the principles of agroecology of the value chain



6.1. The business model: millet production

Millet production is carried out by 200 members, each farming one hectare, for a total area of 200 hectares. With an overall transition score of 64%, this production is engaged in an agroecological transition. This progress is based on three operational criteria: resource efficiency (50%), resilience (57%) and social security and equity. Regarding resource efficiency, millet production is not yet fully agroecological. Efforts are needed to strengthen the recycling and optimization of fertilizer resources. In terms of resilience, significant progress has been made, particularly in economic diversification, but additional actions are needed to improve soil management, animal treatment and biodiversity protection. These initiatives would allow for better integration of agriculture with livestock and agroforestry. Finally, in terms of social security and equity, the transition is more advanced, thanks to a strong involvement in skills development, the promotion of social and nutritional aspects, market diversification, resource governance and networking. However, efforts still need to be made to strengthen social justice.



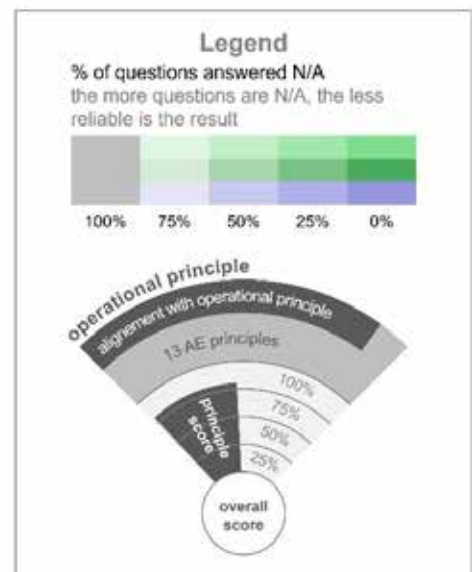
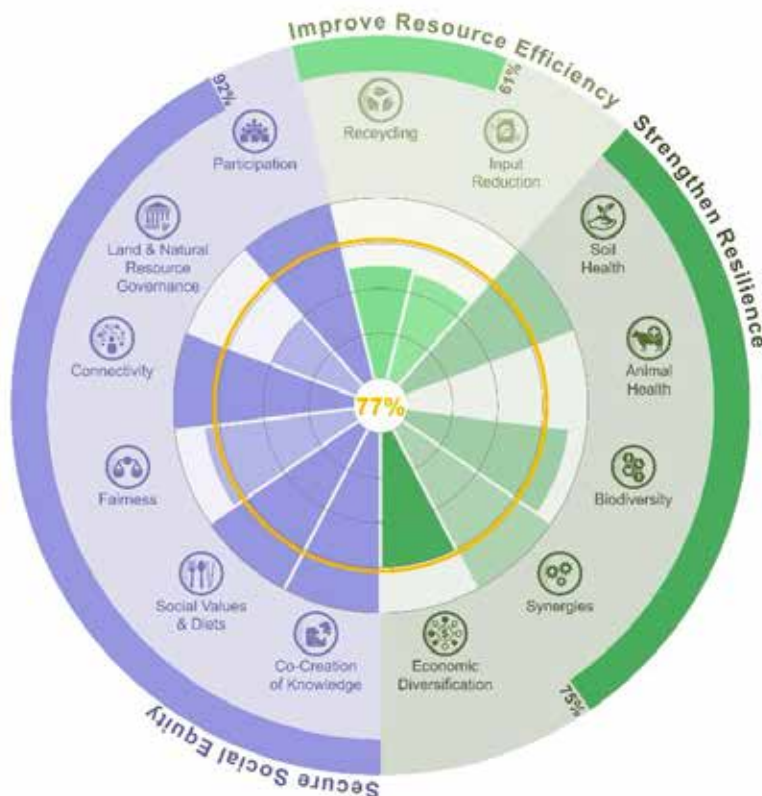
6. Analysis of the level of alignment with the principles of agroecology of the value chain

6.2. The business model: local cereal processing unit for women

The processing unit, composed of 30 members, is committed to a diversified valorization of millet products. Recently created and in the development phase, it is already in advanced agroecological transition, with an overall score of 77%. This progression extends to several operational dimensions, including improving resource efficiency, resilience and social security.

In social security, the unit shows an advanced transition with a score of 92%. However, additional efforts are needed to strengthen the management of natural resources, in particular by expanding its influence with raw material suppliers (millet producers). Regarding resilience, the unit is also in advanced transition. However, it must improve economic diversification and increase its influence with suppliers to better protect biodiversity.

In terms of resource efficiency, the unit is still in an intermediate transition. Efforts must be made, in particular to encourage suppliers to adopt recycling practices and to optimize the use of inputs.

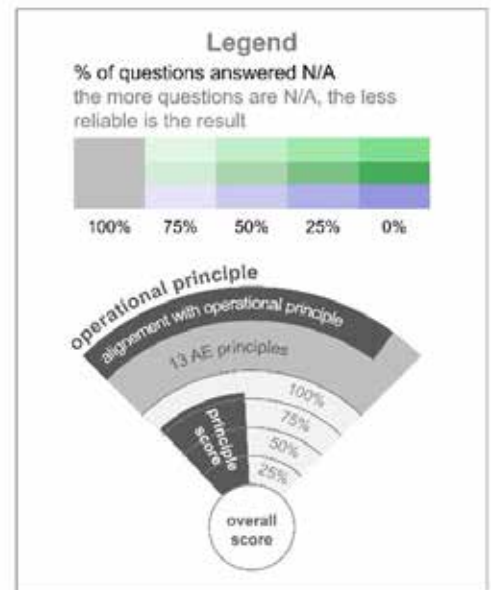
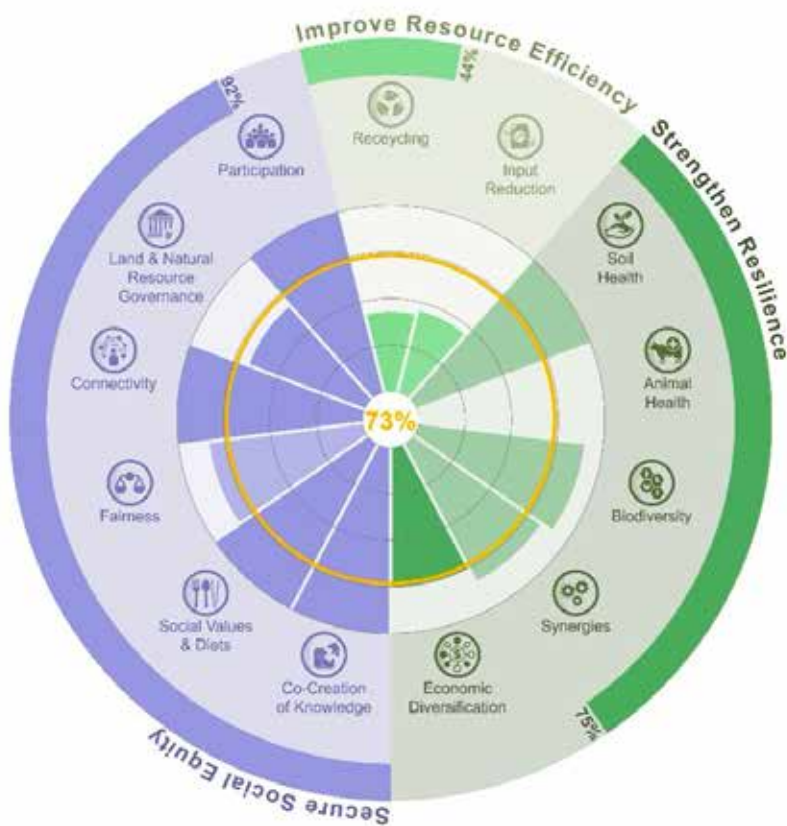


6.3. The business model: the bakery

The bakery is engaged in an advanced transition towards agroecology, with an overall score of 73%. This progression is particularly supported by two operational criteria: social security, which obtains a score of 92%, and resilience, evaluated at 75%. However, efforts are still needed in the areas of social security and equity, in particular to strengthen its influence on the governance of natural resources.

To improve its resilience, the bakery must continue to work on diversifying its sources of income, particularly through the development of new products, as already planned in its action plan. On the other hand, the transition remains less advanced with regard to the reduction of inputs.

To intensify this transition, the bakery must prioritize the adoption of more sustainable energies, by gradually replacing fossil fuels with renewable energies for the operation of its machines. In addition, it should strengthen its power of influence with its raw material suppliers to encourage more environmentally friendly practices, such as the reduction of plastic packaging and the use of renewable fertilizers at the farm level.



7. Analysis of the economic performance of business models

The analysis of the financial and economic profitability of millet in agroecological transition, both at the level of production and that of the processing of derived products or substitution with wheat in compound bread, gives positive results. Indeed, the benefit-cost ratio (BCR) is greater than 1, with respective scores of 1.93 for production, 1.98 for the processing of derived products, and 1.33 for compound bread. Thus, each CFA franc invested in these activities generates a net profit of 0.93 FCFA for production, 0.98 FCFA for processing, and 0.33 FCFA for compound bread.

Discount rate	BM - Millet production		BM - Local cereal processing unit for women		BM - Bakery	
7,5% - 13%						
Year	Benefits cashflow	Costs cashflow	Benefits cashflow	Costs cashflow	Benefits cashflow	Costs cashflow
1	270 000	152 000	2 250 000	1 205 068	30 222 000	60 512 642
2	270 000	132 000	2 250 000	1 220 368	96 710 400	84 666 830
3	270 000	137 000	2 592 000	1 220 368	120 888 000	93 978 642
4	270 000	137 000	2 478 000	1 279 656	156 366 000	92 708 642
5	270 000	137 000	2 763 000	1 309 656	156 366 000	90 261 942
Present Value of cashflows	1350000	695000	12,333,000	6,235,115	560 552 400	422 128 697
BCR	1.94		1.98		1.33	

8. SWOT analysis of business models

8.1. The business model: millet production

The SWOT analysis highlights the key points of the organization. Among the strengths, it stands out for its formal structuring, its organizational dynamics, its cooperative spirit and the involvement of young people, while progressing in an agroecological transition. It benefits from a certain profitability, autonomy in seed supply, mastery of technical itineraries and the value chain, as well as functional infrastructure and equipment. However, weaknesses persist, including difficult access to input markets and land, a lack of labor, training gaps (e.g. on composting), aging agricultural equipment and the absence of adapted varieties. Opportunities include the promotion of local consumption supported by public policies, diversified partnerships, the creation of support platforms, the promotion of local cereals, the diversification of activities, the return of rains and a growing demand for millet. Finally, threats include demographic and land pressure, the impacts of climate change (floods, irregular rainfall), salinization and soil degradation.

SWOT ANALYSIS

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none">• Formal organization• Organizational dynamics• Cooperative spirit• Youth involvement• Agro-ecological transition• Profitable• Self-sufficiency in seed supply• Mastery of technical itineraries• Functional infrastructure and equipment• Mastery and understanding of the value chain	<ul style="list-style-type: none">• Difficult access to input markets• Difficult access to land• Manpower• Lack of training (e.g. composting) Aging farm equipment• Lack of adapted varieties	<ul style="list-style-type: none">• Promoting local consumption (consumers and public policies)• Diversified partnerships• Creation of support platforms• Adding value to local cereals and diversifying activities• Return of rains• Rising demand for millet	<ul style="list-style-type: none">• Demographic and land pressure• Climate change (e.g. flooding)• Irregular rainfall• Soil salinization and degradation

8.2. The business model: the transformative woman unit

The SWOT analysis highlights several strategic elements. Among the strengths, the organization benefits from recognized traditional know-how, training received and provided, a profitable activity thanks to very competitive sales prices, as well as strong organizational dynamics and consumer confidence. It also stands out for its broad and diversified offering, recognized quality, a well-started ecological transition, a good brand image and efforts in communication and networking, supported by strategic partnerships. However, weaknesses are slowing down its development, including the lack of production and processing infrastructure, a poorly diversified market, insufficient equipment, limited capacity for action, weak marketing capacity, an entrepreneurial spirit to be strengthened and the absence of FRA authorization. Opportunities include the promotion of local consumption supported by public incentives, new promising partnerships (Dytael, research) and market prospects such as Humundi school canteens. Finally, threats include increased competition, the impacts of climate change on the supply of raw materials and rising prices.

SWOT ANALYSIS

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Organizational dynamics • Corporate spirit • Strategic position and leadership • Profitable business models • Brand image and attractiveness • Mastery of bread-making processes • Mastery of the value chain • Marketing (stores and kiosks) • Incorporation of local cereals (agroecological) • Diversified partnerships (Dytael and research) 	<ul style="list-style-type: none"> • Insufficient equipment (ovens, processing equipment adapted to local cereals, product transport equipment (especially during wintering)) • Expand processing room • Improve the splendor of the commercial space • Low level of diversification 	<ul style="list-style-type: none"> • Promotion of local consumption (public policy incentives) • New outlets (e.g. Humundi and school canteens) • New infrastructure and services (higher standard of living in Niakhar) • Storage capacity and new warehouses 	<ul style="list-style-type: none"> • Unfair competition within the sector: lax quality control • Need to normalize consumption of local cereals • International market prices and external shocks • Consumer hesitation towards incorporated bread • Partnerships with Dytael • Communication • GSP outlook • Supply of raw materials threatened by climate change • Market instability

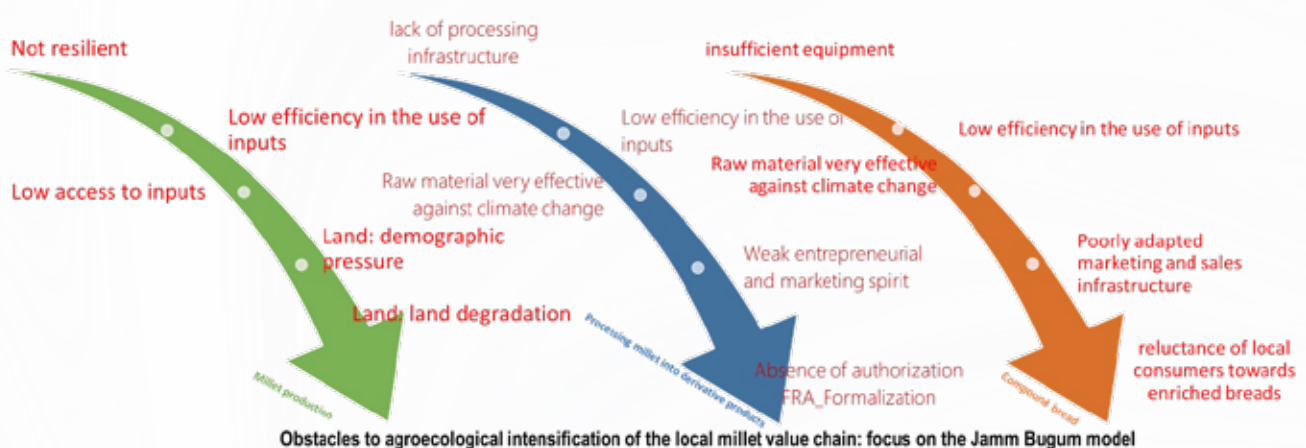
9. Analysis of the brakes and levers of business models

The levers of action for the development of the millet sector are based on several key elements. On the one hand, public policies are a major asset, promoting sustainable development, the agroecological transition and the promotion of local consumption, particularly through school canteens. On the other hand, the sector benefits from the creation and strengthening of knowledge networks and connectivity, thus improving social security and equity. Millet production is characterized by high capacity and promising profitability, with a market that is still diversified but needs to be consolidated for long-term stability. The transformation of millet into derived products is supported by an advanced agroecological transition, allowing for high value-added products and good profitability. The sector is also showing signs of resilience, necessary to adapt to challenges. Finally, the production of bread made with millet incorporated benefits from large-scale production capacity and an innovative market that opens up new opportunities. These combined levers create a favorable framework for sustainable and inclusive development of the sector.

9. Analysis of the brakes and levers of business models



The development of the local millet value chain is hampered by several challenges. At the production level, the main constraints include low resilience to climatic hazards, inefficient use of inputs, limited access to them, as well as land issues related to population pressure and land degradation. For processing into derived products, the major obstacles are the lack of suitable infrastructure, the dependence of the raw material on climate change, low efficiency in the use of inputs, a limited entrepreneurial and marketing spirit, as well as the absence of formalization and authorizations. Finally, for millet-based composite bread, the challenges lie in the lack of equipment, inadequate marketing and commercialization infrastructure, low input efficiency, the vulnerability of the raw material to climatic hazards and the reluctance of local consumers towards these enriched products.



10. Conclusion

In-depth analysis of the millet value chain in the context of the agroecological transition in Senegal, led by the Jamm association Bugum and the Local Dynamics for the Agroecological Transition of Fatick (DyTAEL), shows significant progress while revealing significant challenges. The implementation of agroecological practices and the integration of millet into local products, such as composite bread and derived products, offer opportunities for value creation, strengthening food security and stimulating the local economy. The agroecological transition, although already advanced in some activities, requires continued efforts, particularly to improve resource efficiency, manage biodiversity and strengthen resilience to climate hazards.

The levers identified, such as public policy support, encouraging local consumption and collaboration with diverse partners, promote progress towards a more sustainable model. However, obstacles persist, such as limited access to resources, lack of adequate infrastructure and challenges related to product diversification and marketing.

To maximize the impact of the agroecological transition, it is crucial to strengthen the technical and organizational capacities of local actors, diversify markets and develop adapted infrastructures. Furthermore, more robust public policies and better coordination between local and national actors are essential to overcome obstacles and promote an inclusive and resilient economy.

Ultimately, the potential for agroecological transition through the relocation of millet value chains is considerable. Jamm 's commitment Bugum and local partners, supported by favorable policies, can help make the department of Fatick a model of resilience, sustainability and inclusive economic development, capable of contributing to the national objectives of food security and agroecological transition by 2035.

It would therefore be interesting to analyse the potential impact of the relocation of value chains on the local economy and job creation, in order to serve as an incentive to encourage public policies to further promote sustainable agriculture and the development of territorialised food systems.

Dynamic for the agroecological transition (Dytael) in Fatick - Senegal

Relocalization of the millet value chain for the territorialization of agroecology

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