

Operationalizing the Fodder Market in Livestock Production Systems in South Kivu and Tanganyika Provinces (DR Congo): lessons from the PICAGL Project

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ABSTRACT

Transhumance remains one of the main drivers of conflicts between farmers and livestock keepers in South Kivu and Tanganyika provinces. The lack of available grazing land, livestock instability, and the frequent movement of herds result in crop destruction and declining yields. Since 2019, an integrated system for fodder production, processing, conservation and marketing has been established with the support of the PICAGL project and the technical expertise of Vétérinaires Sans Frontières Belgium (VSF-B). The present study analyses the operationalization of the fodder market and assesses its role within livestock production systems. The results reveal the establishment of 787 hectares of fodder fields, the construction of 32 silos and 25 feed-banks, the production of 26,657 tons of leafy biomass and 757.5 tons of seeds and grains, as well as 4,564.66 tons of compounded feed. In total, 9,933 Tropical Livestock Units (TLU) were supplied over a five-year period. Once considered a utopian concept, the fodder market is now emerging as a structural alternative that contributes to reducing agropastoral conflicts while generating income for agropastoral households.

KEY WORDS

Fodder; fodder market; transhumance; Tropical Livestock Unit (TLU); PICAGL; VSF-B.

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INTRODUCTION

In the rural areas of the South Kivu and Tanganyika provinces, transhumance is increasingly becoming one of the dominant livestock production practices, especially among individual herders. The fodder system in its components of permanent pastoral space, grazed and/or parkland fallows, the fodder-tree banks, and crop by-products (post-harvest grazing) (Blanc-Pamard & Boutrais, 1994) no longer meets their needs. Due to the lack of pastures and livestock infrastructure, livestock keepers, especially during the dry season, travel long distances

every day with their herds in search of substantial quality fodder (FAO, 2012; Konare & Coulibaly, 2019; Turner & Schlecht, 2019). Generally associated with extensive livestock production systems, transhumance provides access to seasonal pastures. However, its consequences become even more cumbersome when resources become scarcer and livestock cross agricultural areas, especially destroying crops (Kohlhagen, 2002; Marega & Mering, 2018). As a result, several studies (Bassett, 2009; Brabant & Nzweve, 2013; Catley et al., 2013; Ickowicz & Moulin, 2022; Samuels et al., 2019; Soumaoro et al., 2025) establish a strong correlation

between pastoral mobility, agricultural density, climate change, and land insecurity.

Sometimes, the phenomenon of livestock invasion into agricultural fields remains the cause of crop destruction, violent reprisals, persistent socio-economic instability and persistent conflicts between herders and farmers. Very complex, they are often fueled by various dynamics: socio-economic, land-related, political, and cultural. For a long time, these tensions have been characterized, in several agro-pastoral regions of sub-Saharan Africa, by frequent conflicts related to competition for natural resources (Brabant & Nzweve, 2013; Krätli & Toulmin, 2020; McPeak et al., 2011; Moore et al., 1999; Nassef et al., 2023). Other explanatory factors include population growth, urbanization, the reduction of arable land, the decrease in wetlands, as well as the land ownership fragmentation (Sougnabé & Reounodji, 2021). On one hand, farmers blame herders for the intrusion of livestock and the damage caused to crops; herders, on the other hand, denounce the increasing privatization of land and the disappearance of pastures. As an adaptive response to agro-climatic variations (Flintan et al., 2013), transhumance exacerbates these tensions when it crosses intensive agricultural areas.

Among other consequences, the instability of livestock and the precariousness of animal feed lead to low milk and meat production. Consequently, the lack of a structured feeding system for livestock, the shortage of pastures, land insecurity, demographic pressure, and the expansion of agricultural activities are all factors that make transhumance a source of conflict or rivalry in the agropastoral sector (Bassett, 2009; Brabant & Nzweve, 2013). In this context, the classic regulatory mechanisms (Diallo, 2025) - customary mediation, damage compensation, pastoral corridors - frequently prove inadequate or inapplicable. Faced with this situation, various agropastoral innovations, focused on livestock stabilization, have been experimented in other regions of Africa. These innovations include pastoral corridors, animal feeding centers, silage production, fodder markets, pastoral cooperatives, and livestock feed banks (Amoussou, 2008; Assani, 2009; Ndikumana et al., 2000). According to these authors, the establishment of fodder cooperatives has reduced seasonal pastoral mobility by stabilizing the supply of livestock feed. The objective of these initiatives is to

contribute to the livestock stability and the reduction of conflicts.

In South Kivu and Tanganyika provinces, the daily movements of livestock back and forth between the kraal, the pastures, and the watering hole constitute a source of crop destruction (Brabant & Nzweve, 2013). The number of incidents increases even more during the “small transhumance” that takes place in the Plain. During this period, many herd owners face multiple fines related to crop destruction caused by their livestock. To address these challenges and implement these livestock stabilization innovations, the PICAGL project has established a structured system for fodder production and sales in both provinces. PICAGL “Projet Intégré de Croissance Agricole dans les Grands-Lacs” (Integrated Agricultural Growth Project in the Great Lakes) is a project of the Congolese government (implemented in the Provinces of South Kivu and Tanganyika, particularly in the Bukavu-Uvira-Kalemie corridor - Bukavu, Ruzizi Plain and the Baraka-Fizi-Kalemie Coastal Plain - from 2018 to 2024) and includes the development of fodder fields, the training of agropastoralists, the transformation of fodder into silage, the establishment of livestock feed banks, and the emergence of a functional fodder market. The main hypothesis is that this market provides a reliable alternative to transhumance and a factor in conflict mitigation. It increases fodder availability, although the least expensive way to feed domestic herbivores is to take them to graze in natural vegetation (Bimenyimana et al., 2024; Klein et al., 2014). This market thus, constitutes a local innovation introduced within the framework of the PICAGL project to stabilize livestock, limit pastoral mobility, and reduce friction between communities. It also constitutes an important source of income for producers (Sanou et al., 2016, 2011).

For this reason, the operationalization of the fodder market appears to be an innovative and promising solution. The principle is simple: locally producing enough fodder, permanently available, financially accessible, and supported by appropriate infrastructure and governance systems. Such a system reduces the dependence of herders on natural grazing and, consequently, the need for seasonal migrations. Additionally, it allows for improved access to quality livestock feed for farmers, primarily to increase milk production

(Magnani, 2020; Amadou & Magnani, 2020). The present study analyzes the relevance and results of this innovation. While demonstrating the potential of the fodder market as a systemic solution to reduce transhumance and agropastoral conflicts in South Kivu and Tanganyika provinces, it offers a theoretical, empirical, and operational analysis, aligning with contemporary debates on the sustainable management of agropastoral resources in Central Africa.

This study aims to describe the fodder supply chain and marketing system, and analyze the carrying capacity of livestock fed under this system among agropastoral communities in Sud-Kivu and Tanganyika provinces.

MATERIAL AND METHODS

Study Area

The study was conducted in the South Kivu and Tanganyika provinces, two rural regions characterized by high livestock densities, a strong presence of transhumant herders, and recurrent agropastoral conflicts. These two provinces were covered by the PICAGL project where the International Non-Governmental Organization (INGO) Vétérinaires Sans Frontières – Belgique was involved in supporting the development of agricultural value chains, primarily dairy livestock (Fig. 1). In supporting the livestock farmers, fodder fields were established to improve animal nutrition.

Methodology

The present study proceeded through a participatory approach involving farmers, fodder producers, and market stakeholders. From fodder production to their marketing, including processing and conservation, the implementation of the study involved field observations; quantitative analyzes of the fodder production; data collection from producers; and annual compilation of results.

Fodder production. Production began with the establishment of Farmer Field Schools (FFS), where producers were trained on fodder species identification, sowing, cultivation techniques, and soil management. Next, pilot fields, then shared-

cost fields, and finally integrated crop-livestock fields were consecutively established.

The installation of forage fields and fodder banks mobilized a significant amount of equipment, including: agricultural tools, fodder seeds (*Trypsacum laxum*, *Pennisetum purpureum*, *Mucuna pruriens*, *Stylosanthes gracilis*, *Brachiaria mulato*, *mutica*, and *ruzisiensis*, *Leucaena leucocephala*); means of transportation; infrastructure as earthen silos and livestock feed banks.

Transformation and conservation. A total of nearly 6,601 producers (1,280 individuals and 5,321 grouped into farmers' organizations) were trained in techniques of cutting, chopping, conservation, and silage production.

The fodder banks and silos were built to allow for the preservation of surpluses, reduce post-harvest losses, and facilitate storage for sale during times of scarcity.

Marketing. The forage market is structured



Figure 1. Map of the intervention area of Vétérinaires Sans Frontières in the PICAGL project in the Provinces of South Kivu and Tanganyika.

around two systems: cash sales (at a rate of 5 kg for an average of 1165 Congolese francs over the period, USD 1 = 2800 CDF) and sales in milk equivalent (5 kg for 1 liter of milk), allowing livestock farmers without cash to access fodder.

Producers using fodder bank can sell or borrow fodder according to the conventions established between stakeholders.

Data Analysis. The analysis of quantitative data on biomass, grain, and seed production allowed for the determination, on one hand of the carrying capacity expressed in Tropical Livestock Units (TLU) and, on the other hand, the profits generated from the sale of fodder.

From 2019 to 2024, the production, storage, and sales volumes were collected. The estimation of the carrying capacity was done based on the following ratio: 1 TLU is equivalent to a tropical bovine of 250 kg fed for 365 days a year at a rate of 6.25 kg of dry matter per day. The rate of fodder rejection was estimated at 15% (Boudet & Rivière, 1968).

Conceptual Framework

The conceptual framework adopted in this study posits that the operationalization of the forage market has five main effects: an effect on animal feed availability, an effect on pastoral mobility, an effect on agropastoral conflicts, an effect on milk production, and an effect on income.

Local fodder production ensures a consistent feed supply and reduces dependence on natural pastures. When fodder is locally accessible, the need to move herds decreases, the distance and duration of transhumance are reduced. As a result, a decrease in movement leads to a decrease in intrusions into fields and a reduction in agropastoral conflicts. Fi-

nally, thanks to the livestock stability, the breeder not only improves milk and meat production but also increases their income. Hence the logical chain below: Forage market → Local supply → Less transhumance → Fewer intrusions → Fewer conflicts → Improved dairy and meat production → Increased income.

The present study does not explicitly investigate all these effects. It merely focuses on animal feed availability by trying to address the operationalization of the market, in terms of viability through the gain generated as income and livestock feeding. As a result, the livestock supposedly fed in stability have helped reduce transhumance and, consequently, agropastoral conflicts. Also, the fodder market helps increase production and improve the income of agropastoral households.

RESULTS

The main results of this study include information about: Installation of forage fields, Leafy biomass production, Carrying capacity (UBT), Seed and grain production, Feed production in the province, Marketing and generated income from Grains and seeds, Leafy biomass, Commercialization of feed, and Capacity building for livestock farmers.

Between 2019 and 2024, nearly 787 hectares of forage fields were established in the two provinces. Similarly, from 2020 to 2024, 32 silos of 6 m³ each and 25 fodder banks were installed. The Table 1 below shows their distribution by province. These infrastructures have helped stabilize the market and facilitate the sale of fodder.

Category of field	Province		Total
	South Kivu	Tanganyika	
Farmer Field Schools	22	6	28
Pilot fields	102	32	134
Shared cost fields	398	185	583
Agri-livestock fields	24	18	42
Total	546	241	787

Table 1. Installation of forage fields (areas in ha).

From 2019 to 2024, 26,657.5 tons of leafy biomass were produced, including 20,788.5 tons in South Kivu and 5,869 tons in Tanganyika. The amount of leafy biomass from green fodder produced is presented in Table 2. Yields are continuously increasing, with a peak in 2023 (10,928 t).

The amount of green fodder leafy biomass produced allowed the estimation of the carrying capacity by defining the number of livestock units (LU) that can be fed per year, considering a rejection rate of 15% for cattle. From the quantities of leaf biomass (26,657.5 tons) produced, it is estimated that 9,933 animal units (AU) were fed over five years, which is equivalent to 9,933 cattle weighing 250 kg fed in tie-stall or free-stall barns for 365 days/year (Table 3).

The total production is 757,536 kg, or 757.5 tons, of which 749,610 kg (99%) are Mucuna, 5,706 kg are corn, and 2,220 kg are soybeans (Table 4).

During the project period, 8 feed mills were in-

stalled, including 5 in South Kivu and 3 in Tanganyika.

The total production is 4564.66 tons, of which 4379.198 tons are in South Kivu and 185.462 tons are in Tanganyika (Table 5). This amount of feed has improved livestock nutrition, as well as increased milk production in the area.

The commercialization of grains and pulses generated a total revenue of 1,804,956 USD, including, \$799,250 in revenue for Mucuna, \$5,402 for corn, and \$4,440 for soybeans (Table 6).

The Table 7 below provides information on the fodder produced and sold in the form of fresh herbs, hay, or silage, and the average income generated, all other things being equal. From 2020 to 2024, the net profit generated from the sale of biomass, across all provinces, is approximately \$998,481. The production cost is calculated based on the quantity sold (Table 7).

During the project period, 8 feed producers were installed, including 5 in South Kivu and 3 in

Year of production	Leaf biomass produced (in tons)		Total
	South-Kivu	Tanganyika	
2020	1,052.2	562	1,614.2
2021	2,200	1,102	3,302
2022	6,576	1,622	8,198
2023	8,768	2,160	10,928
2024	2,192.30	423	2,615.3
Total	20,788.5	5,869	26,657.5

Table 2. Annual leafy biomass production.

Year of production	South-Kivu		Total number of TLU	Tanganyika		Total number of TLU	TLU
	Quantity produced	Useful quantity		Quantity produced	Useful quantity		
2020	1,052.2	894.4	392	562	477.7	209	601
2021	2,200	1,870.0	820	1,102	936.7	411	1,230
2022	6,576	5,589.6	2,450	1,622	1,378.7	604	3,055
2023	8,768	7,452.8	3,267	2,160	1,836.0	805	4,072
2024	2,192.3	1,863.5	817	423	359.6	158	974
Total	20,788.5	17,670.2	7,746	5,869	4,988.7	2,187	9,933

Table 3. Estimation of carrying capacity and definition of tropical livestock units.

Year of production	Mucuna seeds produced in Kg			Grains of Corn produced in Kg			Soybeans produced in Kg			General Total
	Tanganyika	South-Kivu	Total	Tanganyika	South-Kivu	Total	Tanganyika	South-Kivu	Total	
2020	3,200	8,400	11,600	120	0	120	0	0	0	11,720
2021	6,800	16,010	22,810	600	0	600	0	0	0	23,410
2022	11,400	185,400	196,800	900	0	900	0	0	0	197,700
2023	27,800	490,600	518,400	206	3,880	4,086	930	1,290	2,220	524,706
Total	49,200	700,410	749,610	1,826	3,880	5,706	930	1,290	2,220	757,536

Table 4. Seeds and grains production per year and per province.

Province	Feed (in tons)
South-Kivu	4,379.198
Tanganyika	185.462
Total	4,564.660

Table 5. Feed Production.

Tanganyika. The results of their production and sales are presented in the table 8 below and forage market circuit is explain in Fig. 2. During the period under study, the feed mills for which data is available produced nearly 4,564,660 kg of feed, including 318,088 kg for cows, 9,372 kg for poultry, and 4,090,200 kg for small ruminants and others, including fish. They generated a total estimated income of \$687,427 (seven hundred and one thousand six hundred and two US dollars) (Table 8).

Capacity-building training sessions were or-

ganized for stakeholders in the fodder value chain, including most forage producers and a group of feed sellers. The topics on good practices in fodder production, conservation, and marketing were covered. Furthermore, the feed producers were provided feed processing and preservation equipment, particularly for packaging, and received specific training on feed preparation techniques.

As part of the operationalization of fodder markets, 28 collaboration and exchange agreements were formalized between farmers, livestock keepers, and feed suppliers, contributing to the structuring of relationships within the value chain.

Regarding the support for cost-shared sub-projects, 63 structures were monitored, including 40 located in South Kivu and 23 in Tanganyika Province. Among these, 12 structures were provided with tricycles intended for fodder transportation.

Year of production	Mucuna			Corn			Soybean			Total Amount
	Qty	PU (\$)	PT (\$)	Qty	PU (\$)	PT (\$)	Qty	PU (\$)	PT (\$)	
2020	11,600	5	58,000	120	1	120	0			58,120
2021	22,810	5	114,050	600	1	600	0			114,650
2022	196,800	3	590,400	900	1	900	0			591,300
2023	518,400	2	1,036.800	4,086	1	4,086	2,220	2	4,440	1,040.888
Total	749,610		1,799.250	5,706		5,706	2,220		4,440	1,804.956

Table 6. Marketing of Grains and Seeds.

Year of production	Quantity produced	Quantity self-consumed	Quantity sold	Unit selling price	Total sales cost	Unit production cost	Total production cost	Profit
2020	1,614.2	1,520.6	93.6	450	42,120	315	29,484	12,636
2021	3,302	2,377	925	450	416,250	310	286,750	129,500
2022	8,198	3,951	4,247	330	1,401,510	220	934,340	467,170
2023	10,928	6,986	3,942	240	946,080	150	591,300	354,780
2024	2,615.3	1,468.8	1,146.5	110	126,115	80	91,720	34,395
Total	26,657.5	16,303.4	10,354.1		2,932,075		1,933,594	998,481

Table 7. Commercialization of leafy biomass.

Type of feed (kg)	South-Kivu			Tanganyika			Total Revenue in \$
	Quantity produced	Quantity sold	Revenue in \$	Quantity produced	Quantity sold	Revenue in \$	
Cattle feed	298,238	298,238	159,770	198,506	198,506	127,611	287,381
Poultry feed	4,300	4,300	2,150	5,072	5,072	3,483	5,633
Small ruminant and other feed	4,076.660	4,076.660	393,107	13,540	13,540	1,306	394,413
Total	4,379.198	4,379.198	555,027	217,118	217,118	132,400	687,427

Table 8. Sale of feed South-Kivu Tanganyika.

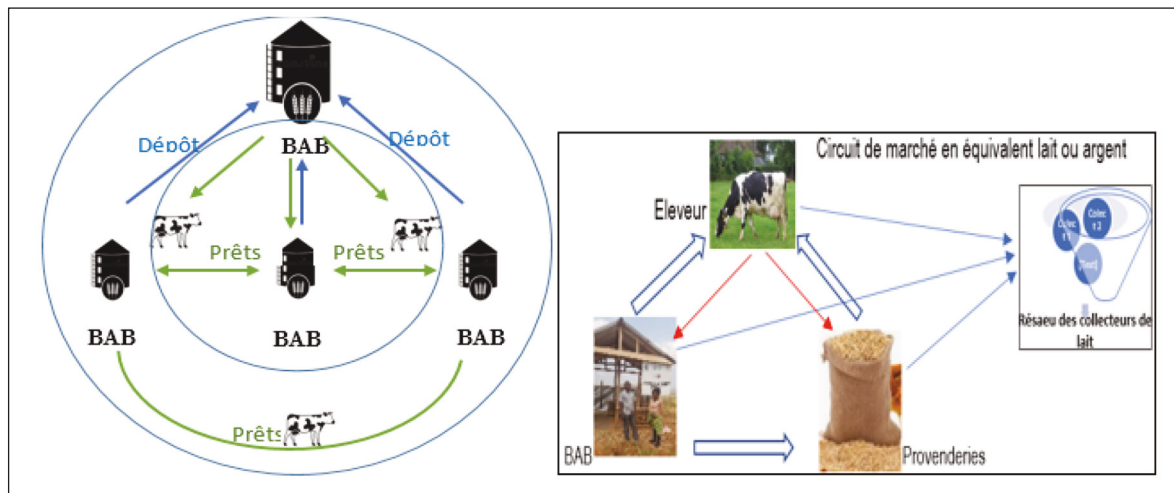


Figure 2. Forage market circuit (demonstrative pictures, in French).

DISCUSSION

The results obtained during the period 2019–2024 show that the fodder market in the South Kivu and Tanganyika provinces constitutes a major inno-

vation in the transformation of local agropastoral systems.

The progressive establishment of 787 hectares of fodder fields demonstrates a rapid and encouraging adoption dynamic of innovations. Before 2019,

the livestock farmers had neither established nor cultivated any forage fields or crops to feed their animals. Since that year, Vétérinaire Sans Frontière-Belgique (VSF-B) has been supporting some leading farmers in establishing fodder fields. The establishment of Farmer Field Schools, followed by the gradual integration of farmer organizations, has facilitated the rapid dissemination of fodder techniques. The progressive increase in managed fodder areas attests the effective adoption of technical innovations. This process reflects the models of participatory agricultural innovation in tropical systems, where collective learning, field school training, and pilot trials promote the adoption and local appropriation of new technologies (Catley et al., 2013; Kasula, 2021).

The growth of fodder production, exceeding 26,000 tons of biomass, reflects the efficiency of introduced species such as *Pennisetum purpureum*, *Trypsacum laxum*, and *Brachiaria* spp. These are appreciated not only by farmers for their high productivity, rapid growth, and good adaptation to humid tropical conditions, but also by animals for their palatability (Granier, 1971; Kiyuku & Bigawa, 2013). The constant increase in yields observed from 2020 to 2023 agrees with observations made in other African contexts where fodder improvement has allowed for a doubling, or even tripling, of available feed resources for livestock (Ndikumana et al., 2000).

The rapid adaptation of these species in the area has allowed fodder producers to open a market for the sale of their field products: green forages, *Mucuna* seeds, soybean seeds, and corn grains. These products are provided to livestock farmers and feed suppliers in cash or milk equivalent. The fodder market now represents an effective regulatory mechanism, comparable to those observed in Kenya, Tanzania, and Ethiopia (Ndikumana et al., 2000).

The cumulative carrying capacity - 9933 LSU in five years - confirms that local forage production can serve as a real substitute for natural grazing (Turner, 2004; Flintan et al., 2013). By limiting movement, the system helps stabilize herds, which mechanically reduces the risk of intrusions into agricultural fields, one of the main triggers for conflicts between farmers and herders (Turner, 2004; Brabant & Nzweve, 2013).

The establishment of livestock fodder banks and

community silos represents a major structural innovation. These devices improve conservation, reduce post-harvest losses, and facilitate community management of surpluses by pooling storage. Experiences from East Africa show that this type of infrastructure increases the resilience of pastoral communities by ensuring stock regulation, stabilizing prices, and securing animal feed during the dry season (McGahey et al., 2014). The results of this study confirm this trend thereby strengthening community cohesion.

With livestock fodder banks, it also happens that a fodder producer has a market to satisfy and is temporarily unable to meet their clients' needs. In this context, they can still borrow from other fodder producers in their area or draw from their quota paid at the food bank level. All these operations are carried out based on the conventions that the different fodder producers have established as a guideline. Following this market model, the farmer is not required to have cash to buy fodder, they have the option to pay for it in milk equivalent. This collection can take place at the fodder producer's level at the fodder bank depending on the context, and the sale of fodder in milk equivalent is done on a conventional basis, between the livestock farmer and the fodder producer.

On the economic front, the commercialization of seeds and biomass, generating over 3.5 million USD, shows that the fodder market is not only operational but also profitable and it is an important source of income for many households and the stakeholders (Faustine et al., 2016). *Mucuna*, representing more than 99% of the seed volumes sold, is emerging as a strategic crop with high economic value, a phenomenon already observed in previous studies where legume fodders have helped diversify peasant incomes (Sanou et al., 2016). The milk equivalent sales system opens new perspectives for financial inclusion for farmers who have low cash (McGahey et al., 2014) and it also helps to strengthen cohesion within the dairy value chain.

In the same perspective, strengthening the technical, organizational, and material capacities of fodder value chain actors is an important factor in the sustainability of the operationalization of the fodder market and for mitigation of agropastoral conflicts (Ostrom, 1990; Bon, 2001; McDermott et al., 2010; Thornton, 2010; FAO, 2017; Sougnabé & Reounodji, 2021). Moreover, thanks to economic incen-

tives for the production and sale of fodder, the fodder market contributes to the transformation of a resource (grass or fodder) traditionally considered non-marketable and freely accessible into a regulated economic good and constitutes a relevant and sustainable strategy for reducing agropastoral conflicts in rural contexts with high land pressure (Thornton, 2010).

Even though the study does not directly evaluate conflict incidents, the observed trends - stabilization of herds, permanent forage availability, structuring of exchanges - align with analyzes establishing a link between pastoral mobility, land pressure, and rural tensions (Bassett, 2009; Moritz, 2012; Rangé et al., 2020; Jacquemot, 2023). The sustainability of fodder systems must also be considered, as it relies on the quality of infrastructure, regular seed renewal, and land security (De Haan et al., 1996) and the links between animal feed and zootechnical performance (Rivière, 1991; Grimaud, 2001; Nasser, 2025). Finally, the fodder market provides a multi-dimensional solution well-suited to the agropastoral realities of South Kivu and Tanganyika. It simultaneously meets the nutritional needs of livestock, stimulates a rapidly emerging local economy, reduces the risk of conflict, and strengthens the resilience of rural households. These achievements make it a promising and potentially replicable model in other regions facing the same challenges in the DRC and Central Africa.

CONSIDERATIONS AND CONCLUSIONS

Despite its relevance, the study has several limitations. It does not directly assess the effect of the fodder market on conflicts: the decrease in tensions is deduced from the reduction in pastoral mobility, without quantitative measurement of incidents (Brabant & Nzweve, 2013). The improvement in milk and meat production also remains insufficiently documented (Grimaud, 2001; Nasser, 2025). The data related to zootechnical performances have not been addressed. The same applies concerning the impact of climate related hazards and land pressures, which are not analyzed, whereas fodder systems are negatively affected by droughts, land use competition, and limited access to water, central factors in pastoral systems (Jacquemot, 2023; Moritz, 2012; Rangé et al., 2020; Retaille, 2003).

Finally, there is a need to question the institutional sustainability of the model (De Haan et al., 1996) due to its dependence on external support. Indeed, the development of fodder banks, access to improved seeds, and training still rely on the support of the PICAGL project and the expertise of VSF-B, and the study hardly addresses sustainability prospects.

Considering the identified limitations and observed results, while aligning with a logic of sustainable livestock production in Africa by 2030 (Herrero et al., 2014), several perspectives emerge. These primarily concern the institutionalization of the fodder market and its integration into public policies. This involves the establishment of local management frameworks (fodder bank committees, fodder cooperatives) that do not depend on project management in order to strengthen economic and organizational sustainability. Like other agricultural products, multi-stakeholder governance involving technical services, local entities, and farmer organizations would ensure the market's anchoring in pastoral management strategies. Also, to increase climate resilience and productivity (Ndikumana et al., 2000), the extension and diversification of forage species are encouraged through the introduction of drought-tolerant and high-nutritive-value species. Other recommendations relate to empirical measures on conflicts and animal production: surveys on agropastoral incidents, followed by zootechnical analyzes, would help scientifically consolidate the links between the fodder market, herd stability, and community peace. Finally, given technological advancements, digitization and traceability can be proposed. The development of local platforms for monitoring stocks, prices, and exchange flows (cash and milk equivalent) would enhance transparency and commercial efficiency.

In conclusion, operationalizing fodder market in South Kivu and Tanganyika provinces constitutes a structural innovation for livestock production and has demonstrated its ability to sustainably transform agropastoral systems. In five years, the establishment of 787 hectares of fodder fields, the production of over 26,000 tons of biomass, the potential stabilization of 9,933 livestock units (LUs), and the generated income attest to effective adoption and a major socio-economic impact. By reducing pastoral mobility, the fodder market has an indirectly poten-

tial to decrease tensions between farmers and herders while improving household resilience. The fodder market, once perceived as a utopia, is now operational and constitutes a tangible reality and a reproducible model in other regions of the DRC, even in Central Africa. Stimulus for cattle farming, it has allowed livestock keepers to find additional feed for their livestock, especially during the dry season, and to increase their household income.

As potentially credible and sustainable alternative to transhumance, this market is a powerful tool for reducing conflicts between farmers and herders and for agropastoral development. By stabilizing animal feed, it stimulates increased milk and meat production, reduces sources of friction in relations between farmers and herders, and improves inter-community relations. The various experiences have also demonstrated that the fodder market can create new economic opportunities. Despite its potential contribution to rural and social stabilization, for this model to succeed, it must be supported by coherent public policies, targeted investments, and inclusive governance.

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