PABRA
Beans for impact and nutrition in Africa
1996-2022

Alliance
Bioversity & CIAT

COMMON BEAN ENTREPRENEURIAL DEVELOPMENT IN SUB-SAHARAN AFRICA

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List of Acronyms

AGRA:	Alliance for a Green Revolution in Africa
CEO:	Chief Executive Officer
ECABREN:	East and Central Africa Bean Research Network
FAO:	The Food and Agriculture Organization of the United Nations
GDP:	Gross Domestic Product
IBPMA:	Improving Bean Production and Marketing in Africa
MSEs:	Micro and small-sized enterprises
NGO:	Non-governmental Organization
PABRA:	The Pan-Africa Bean Research Alliance
SABRN:	Southern Africa Bean Research Network
SSA:	Sub-Saharan Africa
UN:	United Nations
WECABREN:	West and Central Africa Bean Research Network

Executive Summary

Entrepreneurship is a critical driver for social and economic development. However, the agri-food systems are dominated by small and medium scale entrepreneurs, especially women-led enterprises, who face significant challenges in their business operations. The common bean enterprises are examples of enterprises in agri-food systems with relatively high women entrepreneurs attributed to common bean being traditionally considered as a women's crop. This report documents findings from a study conducted in six countries in Eastern, Central, and Southern Africa – Cameroon, Kenya, Rwanda, Tanzania, Uganda, and Zambia. The study analysed the profile and entrepreneurship development, of traders, and processors operating in the common bean value chain. The study also identified resource access, market-related, and production related constraints to entrepreneurship and current and future needs for different types of enterprises.

The methodology involved quantitative data collection from common bean seed producers, traders, and consumers. A total 23 common bean seed producers, traders, and bean processors from Cameroon, Kenya, Rwanda, Tanzania, Uganda, and Zambia participated in online and telephone interview that collected data on their profiles, development, constraints, and needs. The collected data using frequencies and percentages and results tabulated and visualized.

The findings that women dominated bean processing segment of the common value chain. In contrast, men were highly represented in seed production and bean trading. Business structure, model, and operational capacity differed by gender and county, with men-owned enterprises being large-sized with higher operational capacity and potential than women enterprises. These profiles underscore the varying dynamics and challenges within the common bean value chain. The needs assessment results highlight gendered differences in future needs despite both genders having similar current need, with women anticipating a more extensive range of future needs.

Entrepreneurs relied on personal savings at initial stages of business development and have access to a diverse portfolio of financing during business growth. However, disparities exist, with men-owned seed production and bean trading enterprises typically accessing more sources of start-up and enterprise expansion than women-owned enterprise. Consequently, start-up capital was higher for men's seed production and bean trading enterprises, suggesting gendered barriers in accessing finance. Additionally, seed producers, traders, and processors relied on personal savings and project support as primary funding sources. This finding underscores the importance of self-financing and external grants in initial business stages, especially for women entrepreneurs. Most seed businesses have expanded, with women's enterprises in Tanzania and Rwanda showcasing that increased access to financing fosters enterprise growth, despite a gender gap in overall expansion. Women processors also demonstrated that access to diverse startup and expansion capital that supportive environments for female entrepreneurs can eliminate disparities in common bean enterprise development.

The study concludes with three key messages

01

Inclusive business development and support services tailored to financial, technological, and marketing, and managerial needs of entrepreneurs would address seed production and bean trading and processing needs of men and women entrepreneurs.

02

Active participation of youth in the common bean value chain should be encouraged and supported to inject fresh perspectives and skills.

03

Gender-responsive strategies are essential for sustaining and growing businesses within the common bean value chain.

01.
Introduction

1.1 Background

Agriculture is the dominant sector in most countries in sub-Saharan Africa (SSA). The sector directly accounts for approximately 17% of the region's gross domestic product (GDP) compared to the global average of 4% (World Bank, 2023). The contribution of the sector to livelihoods of millions of smallholder farmers and economic growth makes agriculture inevitably critical for sustainable development and food security. Entrepreneurship in agricultural sector is critical for counteracting social and economic issues in the region because of its positive implications on poverty reduction through employment creation, income generation, skills transfer, decreased food costs, and food security (Dzingirai, 2021). Additionally, entrepreneurship has a potential of driving innovations in agriculture and sustaining the sector's contribution to region's economic development (Juma & Spielman, 2014).

The agricultural sector in SSA is characterized by a diverse entrepreneurial landscape of actors operating at different levels and scale. Men, women, and youth entrepreneurs inject unique perspectives and skills to the sector. Women dominate the sector, accounting for approximately 50% of the agricultural labour force (UN Women, 2022). Most women are smallholder farmers and operators of micro and small-sized enterprises (MSEs) in local markets (Siringi, 2011; Moitse, 2022). Men typically operate at larger scale than women due their disproportionately higher access to resources such as land and capital. Youth are less represented in the agricultural value chains despite accounting a considerable portion of the region's population and having the ability to innovate (AGRA, 2020; FAO, 2023). Therefore, diverse roles of men, women, and youth entrepreneurs fortify their contributing to agricultural sector's growth potential in the region.

Unlike in other sectors, agricultural entrepreneurs face several challenges that undermine sector's growth and contribution to economic development (Patel, 2016). Limited access to land, financing, markets, and agricultural inputs undermines the potential of women entrepreneurs in agribusiness (AGRA, 2021). These challenges are created or exacerbated by restrictive cultural norms, discrimination, and legal barriers that prevent women agripreneurs from having equal access to essential resources and services as men (AGRA, 2021). While men often have access to resources than women, they may grapple with issues like market volatility which undermine their ability to maintain larger operations. The underrepresentation of youth in agri-business is due to lack of experience, difficulties accessing credit, gap in knowledge transfer between generations, and the unattractiveness of agribusiness due to low returns (Mueller & Thurlow, 2019; Yami et al., 2019; AGRA, 2020). These challenges undermine productivity, profitability, and growth of agricultural enterprises in the region, a situation that calls for a focused analysis and development of tailored solutions that address unique needs of men, women, and youth entrepreneurs.

Gender and entrepreneurship research has grown over the past two decades to become important in understanding challenges that women entrepreneurs experience in agri-food systems. Sullivan and Meek (2012) indicate that women's motivations for pursuing entrepreneurship are diverse, valuing

autonomy, independence, and work-life balance. There is need to consider women entrepreneurship as a distinct entity in order to account for their diversity in motivation for entrepreneurship without a mere comparison to men (Cardella et al., 2020). Thus, understanding that entrepreneurship can deliver equality and economic should also be another importance consideration when designing approaches that recognize the heterogeneity of women entrepreneurs (Nchanji, 2022). Furthermore, nurturing a future generation of entrepreneurs in requires focus on addressing the gap in youth entrepreneurship. Schøtt and Cheraghi (2015) underscore the importance educational and entrepreneurial skill training for youth to increase their participation in entrepreneurship in agri-food system. Addition, recent literature recognizes the role of multi-faceted approaches to facilitate youth entrepreneurship.

Consequently, a focus on women's entrepreneurship involves understanding how different factors can influence entrepreneurial development. Ogundana et al. (2021) identified access to and use of finances as enablers of development of women's enterprises. Ogundana et al. (2021) explained that financial resources enable women's enterprises to grow their assets, workforce, and customers, contributing to entrepreneurial development. Therefore, going beyond focusing women past a mere focus on characteristics of women is crucial in understanding drivers of entrepreneurship development in agri-food systems in SSA.

1.2 Context

Common bean is an important staple food crop and source of income for thousands of households in SSA. The crop plays an important role in food and nutritional security. For instance, common bean is a rich source of protein, mineral, and micro-nutrients, making it critical to addressing the malnutrition challenge in SSA. The crop is traditionally considered a women's crop because of the crucial role women play in production and marketing (Nakazi et al., 2017). Common bean production varies across the SSA, with Eastern Africa as the largest producer. In 2021, 5.3 million tonnes of beans were produced from 6.1 million hectares in Eastern Africa. It is the second most cultivated and produced legume in Central Africa – 1,704,971 hectares cultivated, and 1,134,699.80 tonnes produced (FAOSTAT, 2023). These data indicate the central role of common bean in securing cash incomes, ensuring food security, and addressing nutrition needs in the region.

According to the Bean Atlas, seed production landscape in SSA is described as immensely supported by the Pan-Africa Bean Research Alliance (PABRA) to enable smallholder farmer access quality seeds of improved and preferred bean varieties (Farrow & Muthoni-Andriatsitohaina, 2021). Common bean seed production by both formal and informal entrepreneurs. Formal sector consists of seed companies and producer groups or cooperative, while informal producers consist of farmers and unorganized seed producing group. Together, seed companies and farmer seed producers/entrepreneurs play distinct roles in seed productions, marketing, and facilitating skill enhancement for seed production (Farrow & Muthoni-Andriatsitohaina, 2021). Thus, seed production enterprises are critical in enhancing seed availability and variety diversity, contributing to PABRA's overall goal of improving bean production in Africa. Bean trade in SSA is better understood through the concept of the bean corridor approach as used by PABRA and development projects (Sperling et al., 2021). There exist three bean corridors in the region – the East and Central Africa Bean Research Network (ECABREN), Southern Africa Bean Research Network (SABRN), and West and Central Africa Bean Research Network (WECABREN) (Buruchara, 2020). These corridors are largely driven by informal seed and grain suppliers. Traders, including wholesalers, exporters, aggregators, and retailers, potential seed traders (large and retail traders) exist (Birachi et al.,

2020). PABRA supports traders with business development services, ranging from training and grants for start-up. Scale of operations of these enterprises differ across countries and corridors. Seed companies and parastatals are responsible for the multiplication and marketing of certified seeds of popular varieties. Formal seed traders are mostly local agro-dealers who link local seed producers with wider markets and providing market intelligence (Farrow & Muthoni-Andriatsitohaina, 2021). Therefore, bean trade targets diverse markets with diverse bean products (Birachi et al., 2011) – seed and grain. Nonetheless, a recent study Nchanji et al. (2023) indicated that women are underrepresented in bean trading in Cameroon, underlying the importance of gender in trade of common bean grain and other products. Inadequate processing capacity in SSA with has been cited as one of the bottlenecks in sub-Saharan Africa's common bean value chain. However, according to Farrow & Muthoni-Andriatsitohaina (2021), bean grain is increasingly being processed in Eastern and Southern Africa. This has been created by the increasing availability of pre-cooked bean varieties that the expanding and changing consumer demand for healthier foods. Farrow & Muthoni-Andriatsitohaina (2021) notes that besides canning, processed bean products, such as flours, pre-cooked beans, frozen beans, canned beans, and bean snacks, are increasingly being availed.

1.3 Objectives of the study

This study aimed to provide detailed demographic and business profiles of seed producers, traders, and processors for a deeper understanding of their roles and contributions within the common bean value chain. The study also aimed to identify and understand the unique constraints and needs that these entrepreneurs face in their entrepreneurial endeavours. The study also proposes solution for addressing the constraints experienced by traders, seed producers, and processors. Therefore, the study objectives are:

a) To analyse the profile of women, men and youth entrepreneurs in common bean value chain and customized needs.
b) To assess the specific business needs and challenges faced by women, men, and youth entrepreneurs and potential solutions.
c) Analyses women's entrepreneurship development in the bean corridor.

02.
Methodology

3.1 Study area

The study area were six countries in SSA. These countries are Cameroon, Kenya, Rwanda, Tanzania, Uganda, and Zambia. These countries are located in three PABRA's bean corridors – Cameroon in the WECABREN, Kenya, Uganda, Rwanda, and Tanzania in ECABREN, and Zambia in SABRN. These countries were selected due to their participation in the Improving Bean Production and Marketing in Africa (IBPMA) project. Tanzania, Kenya, Uganda, Rwanda, Burundi, and Cameroon are among the top bean producing countries in SSA. Despite their prominence in bean value chain, entrepreneurs face several factors that stagnant growth of the bean value change (Lutomia & Nchanji, 2022). The IBPMA project responded to the challenges faced by farmers and entrepreneurs in common bean through innovative programs that aimed to create market linkage within bean corridors by creating business-based gender-responsive bean platforms and partnership.

3.2 Research design

The study utilized quantitative research design to collect that that was critical to understanding the profile, constraints, needs, and development of bean enterprises in six countries. The foundation for this study was a status report that indicated challenges to entrepreneurship development in SSA. The sample size was 23 entrepreneurs spread across three nodes of the common bean value chain – seed production, trade, and processing. The sample size was 23 entrepreneurs spread across three nodes of the common bean value chain – seed production, trade, and processing. A total of 8 seed producers, 8 traders, and 7 common bean processors participated in the study. The distribution of these entrepreneurs by country and gender are presented in Table 1 The targeted number of respondents were not reached due to multiple reasons that varied across countries. For instance, some entrepreneurs in Rwanda indicated that they management has greatly changed hence the information provided would be inadequate. In Kenya, tax issues demotivated participation in the study, while in Uganda some entrepreneurs did not reply to invitations to participate supposedly because of their experiences in previous studies.

Table 1: Sample size by country and gender of entrepreneur

	Seep producer			Traders			Processors			Sample		
Country	**W**	**M**	**Total**	**W**	**M**	**Total**	**W**	**M**	**Total**	**W**	**M**	**Total**
Cameroon	1		**1**		1	**1**		1	**1**	1	2	**3**
Kenya		1	**1**	1	2	**3**	2		**2**	3	3	**6**
Rwanda	1	1	**2**	1		**1**				2	1	**3**
Tanzania	1	1	**2**	1	1	**2**	1		**1**	3	2	**5**
Uganda		1	**1**				1		**1**	1	1	**2**
Zambia		1	**1**		1	**1**		2	**2**	0	4	**4**
Total	**3**	**5**	**8**	**3**	**5**	**8**	**4**	**3**	**7**	**10**	**13**	**23**

Note: W=Women, M=Men

Quantitative survey involving was used to obtain data from seed producers, traders, and processors. Qualitative interviews involved close-ended questions that collected data on demographic and business characteristics of the entrepreneurs and assessment of their needs. The questions asked included sources of capital for startups and enterprise expansion, employees engaged by enterprises, product the enterprises produce, status of business growth before and during the pandemic, and constraints and needs of farmers. The tool was programmed in Free Online Surveys. The link was sent out to the entrepreneur in an exercise that was coordinated by the national bean coordinators. The analytical framework encompassed both quantitative (frequencies) and qualitative analysis (content analysis) techniques.

03.

Seed Production Profile And Development

3.1 Seed Producers Profile

3.1.1 Characteristics of seed producers

The demographic profiles of seed production enterprises are presented in Table 2. Eight seed producers where interviewed. From the two seed producers in Camerron and Uganda, we were informed that seed business in these countries are more cooperative, or group based, and that there exist no seed companies for common beans. In Tanzania, Rwanda, Kenya, and Zambia, we spoke to seed companies. This suggests a more commercial, structured approach to seed production in Tanzania, Rwanda, Kenya, and Zambia.

Three out of 8 seed sampled producers were women entrepreneurs, with one each in Cameroon, Rwanda, and Tanzania. Each country except Cameroon had men entrepreneurs in common bean seed production. Although results indicate women involvement in bean production, the high involvement of men in seed production across the countries indicates men dominance of this high value segment as women remain relatively underrepresented.

The results in Table 2 also shows representation of seed production entrepreneurs by age. Only one young entrepreneur (35 years and below) in Rwanda and one adult entrepreneur (35-55 years) in Cameroon was sampled by the study. This result suggests limited involvement of youth and middle-aged/adult entrepreneurs in seed production business. The domination of elderly (above 55 years), one each in Rwanda, Tanzania, and Zambia, could be an indication that seed production enterprises are operated by individuals with considerable experience in the common bean value chain. However, three seed producers, from Kenya, Tanzania, and Uganda, chose not to disclose their ages.

Table 2: Profile characteristics of seed production enterprises

Characteristic	Cameroon	Kenya	Rwanda	Tanzania	Uganda	Zambia	Pooled
Seed producer							
Producer group	1	0	0	0	1	0	2
Seed Company	0	1	2	2	0	1	6
Gender of entrepreneur							
Woman	1	0	1	1	0	0	3
Man	0	1	1	1	1	1	5
Age seed producer							
Prefer not to say	0	1	0	1	1	0	3
Adult entrepreneur	1	0	1	0	0	0	2
Elderly entrepreneur	0	0	1	1	0	1	3
Market of seed							
Agro dealers/traders	0	1	2	0	1	0	4
Development partners	1	0	0	0	0	0	1
Local markets	0	0	0	1	0	0	1
NGOs	0	0	0	1	0	0	1
Regional markets	0	0	0	0	0	1	1
Years of operation	**2**	**51**	**4.5**	**7**	**9**	**9**	**11.75**

The data provided in Table 2 also shows the distribution different markets that seed producers sell their products. The agro-dealer networks and traders are the predominantly where seed sales occur, as shown by reported by seed producers in Kenya and Uganda. This may imply more commercial or mainstream market approach in the two countries. In Rwanda, seed producers sell to multiple channels – agro-dealers, traders, and development partners –, suggesting a mix of commercialized seed production and project-based marketing of common bean seed. Seed producer in Cameroon sold seed to development partners, indicating a unique market approach and specific project-based selling. Seed companies in Tanzania sold produced seed to local and national markets revealed by 1 seed producer who sold to local market, and another sold to NGOs. Seed producers in Zambia sold seed to regional markets, implying an outward-looking, possibly export-oriented strategy.

The seed producer in Cameroon has been in operations for 2 years, which indicates a recently established seed production operations by the enterprise. The seed producer in Kenya has been in seed production business the longest – 51 years, reflecting its longstanding operations, significant experience, and possibly a stable market presence. The two seed producers in Rwanda have been in operation for an average of 5 years which, like seed producer in Cameroon, indicates relatively new operations. The average years of business operation in Tanzania is 7 showing moderately established seed production. Seed producers in Zambia and Uganda have been in operations for 9 years, reflecting somewhat established operations. These results show that there is a significant range in years of business operation across these countries. These findings can serve as indicators serve as an indicator of market stability and growth within the common bean seed production sub-sector.

The summary of employees for each country in Table 1 reveals possible cross-country differences in scale of seed production. The seed producer in Cameroon do not have any employees, indicating either a sole proprietorship or an extremely small-scale operation. Kenya's seed producer has 165 employees, the largest among the six countries. This may suggest significantly large-scale operations. The average number of employees across the two surveyed producers 9 in Rwanda and 11 in Tanzania, which is an indication that the producers are medium-sized enterprises. Despite having same years of operations, seed producers in Uganda and Zambia appear different in terms of scale of operations as indicated by the number of employees. Whereas Ugandan seed producer employees 6 people, their counterpart in Zambia employees 65 peoples, reflecting relatively large-scale operation in Zambia and smaller scale operation Uganda. This could be explained by possible differences in seed production models and targeted markets. Overall, cross-country variations in number of employees can serve as an economic indicator, reflecting the size and capacity of operations within the seed production landscapes.

3.1.2 Seed producer characteristics by gender

Figure 1 shows the number of seed production enterprises categorized as producer group and seed company by women and men. There is an equal number of seed group production enterprises are led by women and men, with one each. However, more seed companies are led by men (4) compared to women (2), suggests gender disparity in commercialization in the seed production industry.

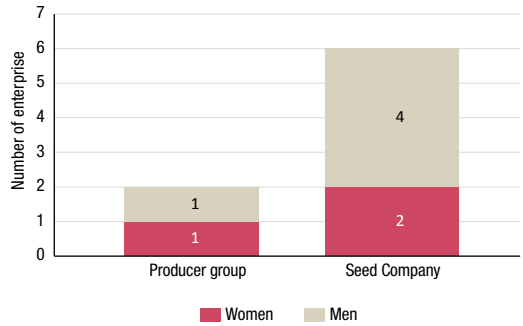


Figure 1: Type of seed production enterprise by gender.

Figure 2 provides a comparison between female and male seed producers in terms of their years of

operation and the number of employees. Women-led seed production have operated for an average of 2 years compared to 17 years of men-led enterprises. Men-led seed production enterprises employees 52 workers which is significantly higher than 5 employees hired by women-led seed production enterprises. These reveal substantial gap in the operational maturity and scale of enterprise operations between men and women seed producers which be attributed to underlying gender barriers to women's engaging in business and operating at scale. These reveals women seed producers need for support in accessing finance, training, and markets to grow their operations.

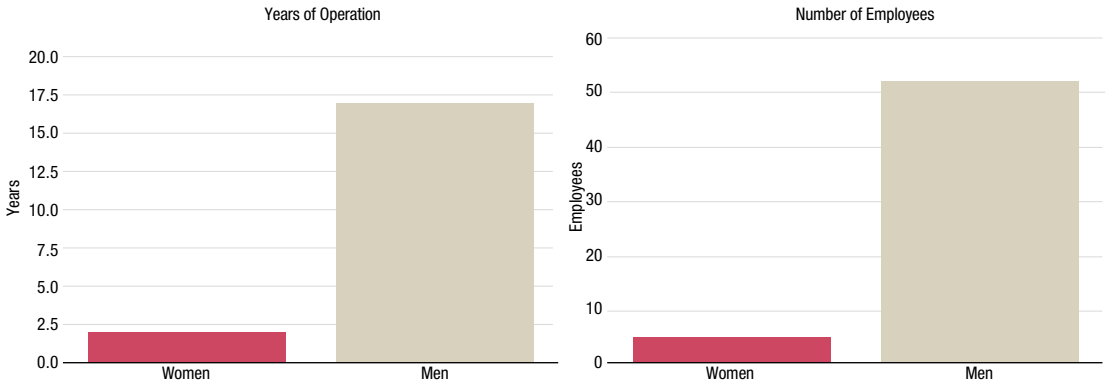
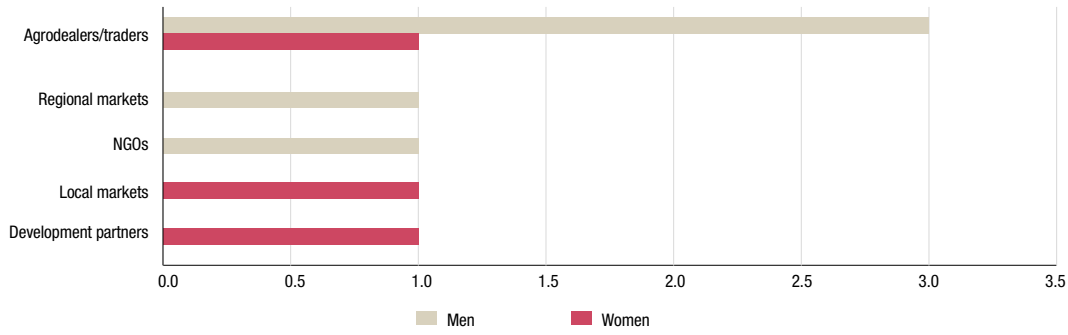


Figure 2: Years of business operations and number of employees by gender of seed producer.

Figure 3 illustrates the types of markets for seed produced by entrepreneurs separated by gender. Men seed producers dominate sales to agro-dealers and traders as shown by three instances compared to one for women. This suggests that men seed producers have a stronger presence in commercial trading networks. One woman seed producer sold to development partners and another sold to the local market. These indicates that women seed producers might be more involved in development projects, benefiting from gender-targeted programs, and have a more prominent role in local, community-based markets. Male seed producer on the other hand sold seed to NGOs and regional markets suggesting a non-gendered access to such NGOs and a wider market reach for men than women. These results highlight clear gender disparities in market access for seed producers, with men having access to a broad market range (commercial and regional), while women are more active in local markets or in partnerships with development partners. These observations have implications on the level of men and women enterprises market integration, needs and opportunities for growth, and sustainability.

Figure 3: Types of markets for seed by gender.



3.2 Organization and seed production and marketing

The survey also determined how seed production is organized across the countries to establish the formality, structure, and management of businesses. Qualitative analysis of this variable revealed diversity in seed production across the countries. While one seed enterprise in Tanzania had a formal and structured organization led by the CEO with Board of Directors providing oversight, another seed producer in Tanzania pursued collaborative planning of their producers. The organization of the latter focused on market demand to determine scale of seed production, suggesting a market-driven and cooperative approach. The sampled group seed producer in Uganda collects seed from affiliated seed companies for distribution to its farmers for multiplication. This indicates a reliance on external seed companies and a structured distribution system. In Rwanda, a seed company blended corporate farming and out-grower cooperative models, suggesting a combination of direct control and cooperative efforts in seed production. Another seed company in Rwanda used purely corporate seed production model, directly controlling the entire seed production process.

There was a mix of a seed cooperative and individual seed multipliers in Cameroon, with the sampled seed producer sourcing basic seeds from research institutions. This arrangement indicates a collaborative effort between research and entrepreneurship. Responses from seed producer in Zambia indicate that the enterprise requires individuals seed producers to form groups to access seed credit from the seed company, but crop production is done individually. This reflects a blend of collective resource mobilization and individual management in seed production in Zambia.

The seed producers were also asked to report what they planned and determined the overall seed production and sales. The responses to this question were qualitative and responses reveal a variety of approaches that are possibly a reflection of different market conditions, technological usage, and business strategies. Seed production in Cameroon is speculative due to an unorganized market, suggesting a higher degree of risk and uncertainty in seed production in the country. The implication of this is either shortages or surpluses in production, which will require a further analysis of the data to substantiate. Seed producers in Rwanda utilize seed distribution channels. This is an indication that a structured approach, with seed producing enterprises possibly relying on established networks or systems for seed distribution. Tanzania organization of seed production involves identification of markets and their needs, while the marketing strategy is based on pre-orders from individual farmers and organized marketing groups. This reflects a market-driven strategy, where the seed producers focus on understanding demand and securing orders in advance.

Analysis of organization of seed production in Zambia reveals an approach that is based on sales projections for the next four years and historical analysis of production and marketing trends. This indicates that the seed producer pursues a data-driven and forward-looking strategy in organizing seed production. The approach in Uganda involves extension staff and field agents assessing prepared land before seed requisition. The staff also engage in monitoring production. They leverage on existing platforms such as the Mastercard Farmer Network to document expected harvests. This implies that seed production in Uganda is comprehensive, technology-based, and involving iterative planning and monitoring. On the other hand, seed production in Kenya relies on official reports. Marketing relies on previous years' actual sales to project sales volumes. This indicates that the seed company in Kenya relies on formal data sources and historical performance for production and sales forecasting.

3.3 Seed production enterprises development

3.3.1 Employment rate

Table 3 traces the number of employees from establishment of seed producers to 2023. Generally, the number of employees has increased considerably from the time of establishment to 2023. This is indicative of business growth and possibly an expansion in seed industry's operations and market reach. However, growth in number of employees was not uniform across countries and by gender. The seed business in Kenya recorded the most substantial growth in number of employees, rising from 7 workers in 1972 to 165 in 2023. This could suggest a robust seed industry in Kenya, benefiting from favourable business conditions, government support, or a larger market size. Seed production business in Zambia also recorded a significant growth from 5 to 65 employees in 10 years. The number of employees in Rwanda increased from 6 to 9 from the time of establishment to 2023. The average number of people employees by seed producers in Tanzania were 11 in 2023 from 6 at time of establishment. In Uganda, number of employees doubled to 6 in 2023 from the time of establishment. The seed enterprise in Cameroon had no hired employees.

Table 3: Trends in enterprise employees by country and gender

		Pooled	Cameroon	Kenya	Rwanda	Tanzania	Uganda	Zambia
Total	When established	5	0	7	6	6	3	5
	In 2023	35	0	165	9	11	6	65
Women	When established		0		4	4		
	In 2023		0		8	7		
Men	When established			7	7	8	3	5
	In 2023			165	10	15	6	65

Table 3 also shows that men seed producers had generally higher number of employees than women entrepreneurs in the sampled. Women seed producers in Tanzania and Rwanda employed an average of 4 workers each at establishment. Employees in women-operated seed production enterprises doubled to 8 in Tanzania and rose to 7 in Uganda in 2023. In comparison, men-owned seed in Rwanda and Tanzania had 7 and 8 employees at the time of establishment and 10 and 15 in 2023, respectively. Although these results indicate gap in business growth as measured by the number of employees, there has been a noteworthy increase in number of employees in women's enterprises. This show that efforts to develop women's entrepreneurship may in PABRA bean corridors over the last decade may be translating into actual growth in women enterprise and creation of employment opportunities. This trend has a potential of contributing to economic development and gender equality within the common bean seed value chain.

3.3.2 Enterprise start-up Financing

The startup capital for seed businesses in various countries and by gender is presented in Table 4. Several insights can be drawn from these results. First, seed production enterprises owned by women had significantly higher average startup capital ($53,510) than women-owned ($3,426) enterprises. The start-up capital was highest among seed producers in Tanzania ($97,495) and the least in Uganda ($2,171), indicating inter-country differences in access to funding resources. The difference in start-up capital for men and women seed producers in was less stark in Rwanda compared other countries such as Tanzania. These results indicate possible regional and country-specific barriers that women entrepreneurs in accessing finance for seed business startups within the bean corridors. This has implications on women's seed enterprises capacities to expand operations, enter new markets, and increase production, negatively impacting business growth.

Table 4: Amount of start-up capital of seed production by country and gender

	Pooled ($)	Women ($)	Men ($)
Cameroon	2,477	2,477	
Rwanda	11,245	3,102	19,388
Tanzania	97,495	4,699	190,292
Uganda	2,171		2,171
Zambia	2,189		2,189
Total	32,045	3,426	53,510

Personal saving and project support were the most common sources of start-up capital for seed producing enterprises, with 5 and 4 instances reported by sampled entrepreneurs, respectively (Table 5). While savings and project support are equally the most common sources of start-up capital for women entrepreneurs, men seed producers had a wider variety of start-up capital sources, obtaining finances from savings, project support, banks, business savings, and NGOs. Comparison by country indicated men-owned seed production enterprises in Kenya, Uganda, and Rwanda obtained start-up capital from banks, while their counterparts in Zambia and Kenya used personal savings (Table 5). In Tanzania, bank loan and business savings were sources of start-up capital among male entrepreneurs. The male entrepreneur in Rwanda also received start-up capital from NGO. In contrast, women seed producers in Rwanda, Cameroon, and Tanzania had project support as source of start-up capital. This finding indicates a broader access to different business financing options for men compared to women entrepreneurs.

Table 5: Sources of start-up capital for seed producers (count)

	GENDER		COUNTRY						POOLED
	Women	Men	Cameroon	Kenya	Rwanda	Tanzania	Uganda	Zambia	
Savings	2	3		1	2	1		1	5
Project support	1	3	1		1		1	1	4
Bank loan		2				1		1	2
Business savings		1				1			1
NGO		1			1				1

The results in Table 5 have several implications for business growth. Diversified funding sources for men entrepreneurs imply possible greater resilience of men-owned seed production businesses to market fluctuations and financial challenges. It also reflects a greater growth potential of men-owned enterprises than women enterprises. Access to possibly larger sums of startup capital from banks by men enterprises suggests that men-owned enterprises can invest and expand their businesses, leading to rapid growth compared to women's enterprises. Project support for women's enterprises indicates the increasing recognition of challenges, such as barriers to women's financial inclusion, experienced by women in seed production. Thus, women entrepreneurs may be benefiting from gender-based targeted entrepreneurship programs, such as PABRA's IBPMA project and other bilateral projects in both the ECABREN and SABRN networks. However, women's reliance on project support can limit growth and sustainability of their businesses.

3.3.3 Business Expansion

Table 6 shows responses to whether seed producers expanded their businesses since establishment. Out of the total sample, 7 businesses expanded since their establishment. Only one women-owned seed production enterprise in Cameroon has never expanded since its establishment in 2021. Two women-owned businesses in Tanzania and Rwanda and all men-owned businesses have ever expanded their operations from establishment to 2023. The visible gender gap in business expansion could be

associated with disparities in access to financial resources as indicated in Table 4. However, expansion of women-owned enterprises in Rwanda and Tanzania is an indication that women entrepreneurs can grow their enterprises effectively given increased access to financing opportunities as men.

Table 6: Number of seed producing enterprises that have expanded their businesses by country and gender.

	GENDER		COUNTRY						POOLED
	Women	Men	Cameroon	Kenya	Rwanda	Tanzania	Uganda	Zambia	
COUNT	2	5	0	1	2	2	1	1	7

3.3.4 Market share

Table 7 provides market share (%) of seed-producing enterprises in the last decade. Pooled results indicate an overall growth of seed production enterprises as indicated by an increase in market share from 18% in 2013 to 46% in 2023. There was substantial increase in market share in Tanzania and Uganda between 2013 and 2023, rising from 20% in 2018 to 71% in Tanzania and from 26% in 2018 to 80% in Uganda. This result suggests that the sampled seed producing enterprises in Tanzania and Uganda had rapid growth or strong positions in the common bean seed production market. There was a consistent growth in market share of the seed producer in Zambia, rising from 30% in 2018 to 51% in 2023. In contrast, market share of bean producing enterprises in Kenya and Rwanda increased from 45% and 50% in 2013 to 80% and 96% in 2018 then declined to 30% and 29% in 2023, respectively. Whereas this could indicate inconsistent growth patterns in Kenya and Rwanda, it also could imply intense competition or shifts in the market landscape. In Cameroon, the sampled seed producer has achieved 10% market share since 2021.

Table 7: Market share of seed production enterprises in 10 years by country and gender

	CURRENT	2018	2013
Cameroon	10.00		
Kenya	30.00	80.00	45.00
Rwanda	29.00	96.00	50.00
Tanzania	70.50	20.00	
Uganda	80.00	26.00	
Zambia	51.20	30.00	
Women	13.00	60.00	33.33
Men	66.24	37.60	9.00
Pooled	46.28	46.00	18.13

The market share of women-owned seed production enterprises increased from 33% in 2013 to 60% in 2018 but declined to 13% in 2013 (Table 7). In contrast, men-owned seed production enterprises recorded significant growth in market share in the same periods, increasing from 9% in 2013 to 38% in 2018 and 66% in 2023. The higher growth trajectory of men-owned seed production enterprises compared to women's enterprises could reflect differences in access to resources, networks, or support mechanisms that facilitate business growth. This is underline by disproportionately higher access to large sums of start-up capital by men and longer history of business operation that possibly enabled men-owned enterprises to build business support networks. Conversely, women's enterprises could be exposed to systemic challenges in accessing finance, markets, or other growth opportunities. Implementing policies and interventions that increase women's access to finance, support networks, market access, gender-focused investments, capacity building, and addressing of historical disadvantage

could help reduce the gender gap in seed production and promote equitable development of seed production enterprises.

3.4 Constraints to bean production and entrepreneurship needs

3.4.1 Constraints to seed production.

As reported by seed producers in across the countries are presented in Table 8 . Access to basic seed, access to land, high cost of basic seed and inputs, lack of machinery, and limited access to finance were the most common constraints reported by seed producer. These issues are significant barriers to the productivity and growth of seed producers. Constraints such as post-harvest pests and access to inputs are also notable as reported by 5 seed producers. Diseases, seed storage issues, and market differentiation are somewhat less frequent but still present challenges more specific to certain regions or types of seed producers.

Table 8: Constraints reported by seed producers across countries.

	Cameroon	Kenya	Rwanda	Tanzania	Uganda	Zambia	Pooled
Access to basic seed	1	1	1	1	1	1	6
Access to land	1		1	2	1	1	6
High cost of basic seed	1	1	1	2		1	6
High cost of inputs	1	1	1	2		1	6
Lack of machinery	1	1	1	2		1	6
Limited access to finance	1	1		2	1	1	6
Post-harvest pest	1	1		1	1	1	5
Access to inputs		1		1	1	1	4
Diseases		1	1		1	1	4
Storage	1						1
Market differentiation	1			1		1	3
Storage				1	1	1	3
Access to labour	1					1	2
Production pests					1	1	2
Quality assurance		1				1	2

Country-specific constraints or less frequent constraints are market differentiation (Cameroon, Tanzania, and Zambia) (Table 8), suggesting challenges in creating distinct market segments or value propositions for different seed types or qualities. Access to labour was reported by seed producers in Cameroon and Zambia, indicating it may be a localized issue related to labour availability or cost. Post-harvest pest and diseases was common but not universal, pointing to climate change challenge. A notable observation is a broad range of challenges in Cameroon and Zambia, suggesting a challenging environment for seed producers. Overall, the results reveal the need for financing solutions, modernization of agriculture, and infrastructure and training.

The constraints were also disaggregated by gender and presented in Table 9. Seed producers identified resource access, cost, market, production efficiency, agricultural and environmental, and quality control related challenges. Resource access and cost-related constraints were almost equally reported by men and women seed producers. This possibly indicates systemic barriers (e.g., land tenure systems) or in-dustry-wide challenges (e.g., input supply chain and financing services, market prices) that both genders struggle with equally. These results indicate the need for interventions, collaborative approaches, and

gender-specific approaches aimed at addressing systemic barriers and reducing costs, such as group purchasing schemes or subsidies, could benefit all producers without trade-offs.

Market-related challenges (market differentiation), production efficiency, and agricultural and environmental challenges were an important constraint for women seed producers than men. This observation implies that women seed producers have less access to market information, networks, or platforms than women and confront challenges in accessing technologies, training, and resources that are critical in efficient production practices and reducing vulnerability to pests, diseases, and possibly climate impacts. Targeted supported for women seed production enterprises, empowerment programs, capacity building, and resource allocation could help women overcome these challenges. On the other hand, quality assurance constraint was less pronounced as only mentioned by two male seed producers.

Table 9. Number of seed producers reporting bean production constraints by gender

CONSTRAINT	WOMEN	MEN
Resource access challenges		
Access to land	3	3
Access to basic seed	2	4
Lack/limited access to finance	2	4
Access to inputs	1	4
Access to labour	1	1
Cost-related challenges		
High cost of basic seed	3	3
High cost of inputs	3	3
Market-related challenges		
Market differentiation	2	1
Production efficiency challenges		
Lack of machinery	3	3
Agricultural and environmental challenges		
Diseases	1	3
Post-harvest pest	1	4
Storage	1	3
Production pests		2
Quality control challenges		
Quality assurance		2

3.4.2 Present and future needs of seed producers

Following the identification of the constraints, seed producers were asked to identify their current and future needs. The results of this assessment are presented in Table 10. Except for Zambia, all surveyed seed producers highlighted financial services as current need underlining access to capital as a primary concern that affects all aspects of seed production. Furthermore, the results in Table 10 also show current needs such as improvements in market access and technology. Seed producers in Kenya, Uganda, Zambia reported technical support as current need, their counterparts in Cameroon and Tanzania mentioned managerial need. Managerial needs here focus on business operations and strategy, while technical needs look at agronomic support for seed producers.

Table 10: Needs of seed producers by country.

	Pooled	Cameroon	Kenya	Rwanda	Tanzania	Uganda	Zambia
Current needs							
Financial	6	1	1	1	2	1	
Market	4	1	1		1		1
Technological	4	1	1		1		1
Technical	3		1			1	1
Managerial	2	1			1		
Future needs							
Market	4	1		1	1		1
Technological	4		1		1	1	1
Managerial	4	1	1		1	1	
Technical	1						1

Cameroon, Rwanda, Tanzania, and Zambia identified market as a future need (Table 10). This is probably due to seed producers foreseeing changes in market dynamics that warrant advance preparations. Except for Cameroon and Rwanda, seed producers in other countries identified technological need in the future. This could be in anticipation of technological advancements that they need to prepare for or the technological advancements in these countries where ICT has been integrated in agriculture. The lesser focus on future technical needs may imply that seed producers are confident in their current technical capacity to operate seed production enterprise.

Table 11 provides needs assessment of men and women seed producers. Currently, financing is an important need for both men and women but there is no indication of the same need in the future. In addition, marketing is also an important current need for both men and women seed producers. While men producers mentioned technical needs as a current need, women reported managerial needs. Men have multiple needs in the future (technological, marketing, technical, and managerial) compared to women (only managerial and market needs). For both genders, the focus on future managerial skills implies a recognition of the evolving complexities in managing seed businesses. The technical focus among men in could be due to the complex nature of expected future operations.

Table 11: Needs of seed producers by gender.

	CURRENT NEEDS		FUTURE NEEDS	
	Women	Men	Women	Men
Financial	3	3		
Managerial	2		2	2
Market	2	2	2	1
Technological	1	3		4
Technical		3		1

04.

Trading enterprises profile and development

4.1 Bean Trading Enterprises Profile

4.1.1 Trader characteristics by country

Analysis of characteristics of common bean traders across countries is presented in Table 12. Women traders are represented in Kenya, Rwanda, and Tanzania with one woman entrepreneur in each of these countries. There is a higher representation of men traders in all countries except Rwanda. Two out of three sampled traders in Kenya were men, while each of the sample traders in Cameroon and Zambia were men. Tanzania had one man and woman bean trader. In terms of age, Kenya had one elderly bean trader and 2 adult traders, while traders in Cameroon, Rwanda, Tanzania, and Zambia were all adults. These results indicate limited involvement of younger and older age groups in bean trade business, indicating a greater need for greater need for inclusivity in common bean trade across the countries.

Table 12: Profile characteristics of common bean traders

	Cameroon	Kenya	Rwanda	Tanzania	Zambia	Pooled
GENDER OF ENTREPRENEUR						
Women	0	1	1	1	0	3
Men	1	2	0	1	1	
AGE OF ENTREPRENEUR						
Adult entrepreneur	1	2	1	2	1	7
Elderly entrepreneur	0	1	0	0	0	1
TYPE OF BUSINESS						
Aggregator	0	3	1	1	1	6
Retail	0	0	0	1	0	1
Wholesale	1	0	0	0	0	1
Nature of business (formal)	1	3	1	2	1	8
TYPE OF OWNERSHIP						
Group	0	2	0	0	0	2
Partnership	1	0	0	0	0	1
Sole	0	0	0	1	0	1
Company	0	1	1	1	1	4
YEARS OF OPERATION	**15**	**4**	**3**	**12**	**9**	**8**

Further profiling of trader characteristics highlighted the role of aggregators in bean trade. Six out of eight sampled traders across the three countries were aggregators, particularly in Kenya where all three entrepreneurs fall into this category. Tanzania had an aggregator and a retailer while the trader in Cameroon was a wholesaler. In terms of nature of business, all sampled traders were formally registered business entities. Further analysis indicated diverse types of business ownership, with one business and two businesses indicating that their business were companies and group-owned, respectively. One trader in Tanzania was an individual trader, while another was a registered company. Traders in Rwanda and Zambia were all companies. The type of ownership in Cameroon was partnership, with 6 partners and 12 group members. These results reflect regional differences in how bean trading businesses are

set up and operated. Traders in Rwanda and Zambia are all companies, while there is a mix in Tanzania and Kenya, and partnership-based operation in Cameroon.

In terms of years of operations, some countries have relatively young enterprises, while others have established businesses. Bean trade enterprises have been operating for 15 years in Cameroon, 4 years in Kenya, 3 years in Rwanda, 12 years in Tanzania, and 9 years in Zambia. These differences in years of business operations could be attributed to market dynamics rather than the stage of business development or maturity of the bean trade industry.

4.1.2 Trader characteristics by gender

Figure 4 provides a visual representation of the number of traders in each category of business ownership by gender. There is equal representation of men and women traders in group-owned (1 for both gender) common bean trade enterprises and in those operated as companies (2 for each gender). This suggests a balanced gender presence in these forms of business ownership. In contrast, there are gender imbalances in sole proprietorship and partnerships in bean trading enterprises, with only men enterprises (1 in each category of ownership) being represented. This result indicates a gender gap in these types of business ownership. The absence of women participation in partnerships and sole proprietorships is possibly because of social barriers rooted in societal and cultural beliefs, structural barriers embedded in existing social, institutional, and economic structure, or gendered preferences that influence women's involvement in certain types of business ownership.

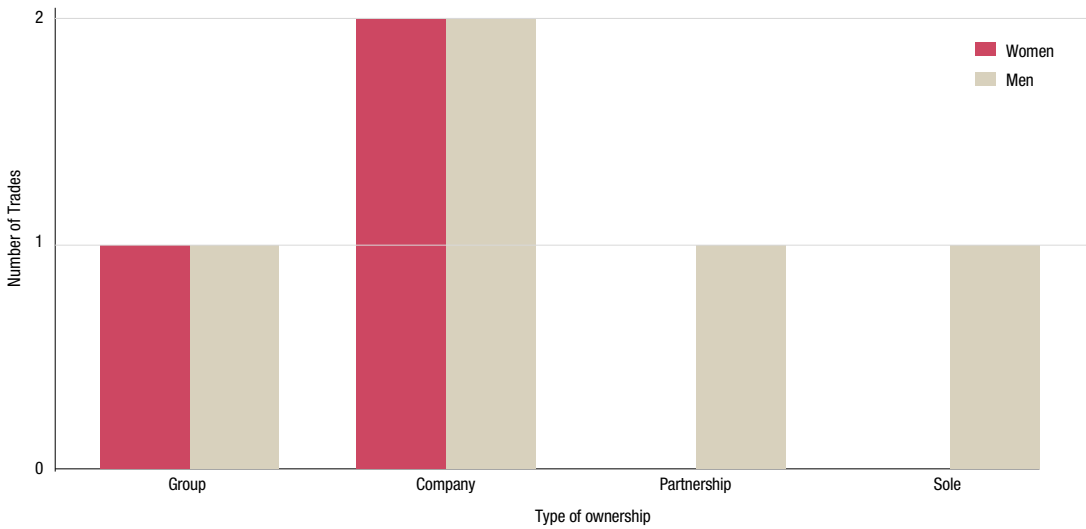


Figure 4: Type of business ownership of bean trading enterprises by gender.

The type of business is also disaggregated by gender and presented in Figure 5. There is a notable gender disparity in the number of men and women traders operating as aggregators. The number of men aggregators (4) is twice the number of women (2) aggregators. Only women are represented (1), in retail trade of common beans, indicating a gender-specific presence in this type of business. In contrast, only men enterprise (1) operates as a wholesale bean enterprise, further indicating gender gap in this type of business. Besides social norms, the disparity in business types by gender can be attributed to access to resources (women are disadvantaged than men), differences in access to networking and support

services in favour of men traders due to historical and systemic advantages in the business world, and possible gender disparities in education and training. Gender differences in risk taking and averseness and possible work-life balance considerations may also push women into flexible ventures such as retail. Thus, understanding these factors is crucial for developing strategies that would address gender disparities in business and create a more inclusive economic environment in the common bean value chain.

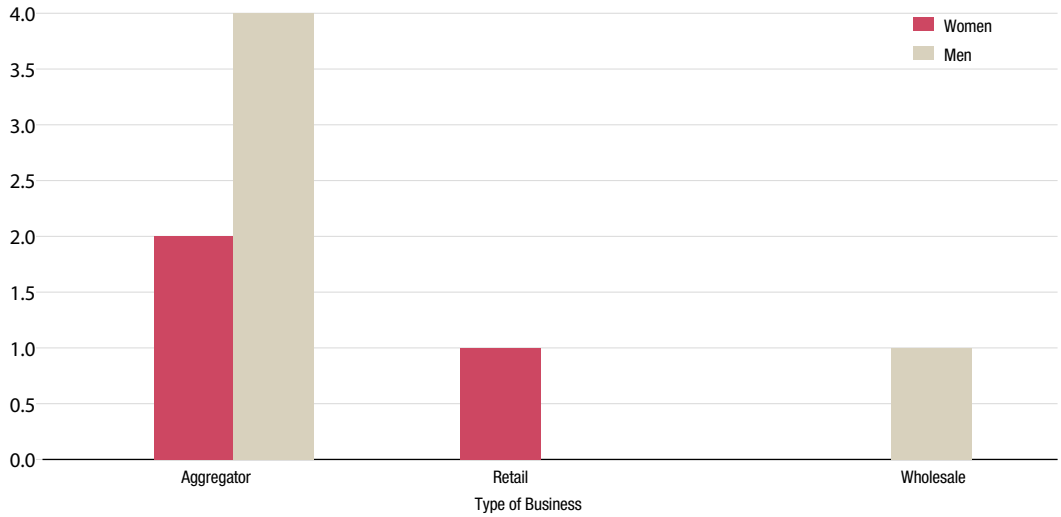


Figure 5: Type of bean trader by gender.

Disaggregation of years of business operation of trade enterprise revealed that men enterprises have been operating for relatively longer (8 years) than women enterprises (6 years). This result could be attributed to either more sustained business operations by men traders, which has sustainability implications. For instance, men-led enterprises may be more resilient to market fluctuation due to their disproportionately high access to support services or business networks. Besides, the difference in years of operations could be because of earlier entry into the market by men traders, pointing to possible entry barriers for women, such as societal, cultural, or economic factors. This result indicate need for gender-sensitive policies, reduction of entry barriers for women, and gender inclusivity in business development services.

4.2 Bean trading enterprise development.

4.2.1 Enterprise start-up financing

Table 13 presents start-up capital for traders. The pooled results indicated that men traders had a higher total amount of start-up capital ($35,304) compared to women ($5,394). Start-up capital for the male trader in Cameroon was $5,004 compared to $1,447 for male entrepreneurs in Zambia. Women traders in Tanzania did not report start-up capital, but men reported $156,800. The sampled women common bean trader in Rwanda had a start-up capital of $15,481. Both men and women entrepreneurs in Kenya reported start-up capital, with women traders started with significantly less capital ($700) compared to men ($6,647). These results indicate that men traders generally have access to more start-up capital than women traders, which could be attributed to differential access to credit, savings, or investment funds.

This suggesting the need for interventions that create tailored financial products for women entrepreneurs in the common bean.

Table 13: Amount of start-up capital of trading in common beans by country and gender

	Pooled ($)	Women ($)	Men ($)
Cameroon	5,004		5,004
Kenya	4,664	700	6,647
Rwanda	15,481	15,481	
Tanzania	78,389		156,776
Zambia	1,447		1,447
Total	**24,088**	**5,394**	**35,304**

Personal savings were a predominant source of start-up capital across genders and countries, indicating reliance on self-financing to start trading activities (Table 14). Project support was the second most common source of start-up capital for traders, suggesting external financial support programs, such as grants designed to encourage entrepreneurship in common bean value chains. Women traders solely relied on personal savings (2 instances) and families or friends (2 instances) for their start-up capital. In contrast, men traders accessed start-up capital through a variety of sources, including bank loan, personal savings (4 instances), and project support (2 instances) to finance their bean trading enterprises. Whereas there was a strong indication that traders are mainly using personal savings and receiving financial support targeting the trading businesses, there existed gender disparity in accessing various types of capital that necessitate gender-focused financial inclusion initiatives.

Table 14: Sources of start-up capital for common bean traders (count)

	Bank loan	Family/friend	Group loan	Personal savings	Project support
Pooled	**1**	**1**	**1**	**6**	**2**
Country					
Cameroon			**1**	**1**	**1**
Kenya				**2**	**1**
Rwanda		**1**		**1**	
Tanzania	**1**			**1**	
Zambia				**1**	
Gender					
Women		**1**		**2**	
Men	**1**		**1**	**4**	**2**

The results in Table 13 and Table 14 reveal several aspects of entrepreneurship development in the common bean trading sector. First, there exists uneven access to resources that are critical to business establishment and growth. Second, high reliance on personal savings for both men and women traders could indicate limited availability of external financing options for start-up in bean trade. Conversely, preference for self-financing could be attributed to unfavourable terms of available credit sources, a gap that could be closed through external initiatives that traders are able to leverage. Men's ability to access funds from banks suggest gender gaps in access to formal financing. This possibly arises from potential barriers to women's accessing formal credit. Therefore, gender-specific interventions and policies that encourage equitable access to entrepreneurship development, such as microfinance, grants, and training programs, should be designed to address challenges women entrepreneurs experience in accessing start-up capital.

4.2.1 Expansion of Bean Trading Enterprise

The number of common bean trading enterprises that have ever expanded their businesses is presented in Table 15. There was 100% enterprise expansion rate among surveyed traders. These results show that both men and women bean traders have been successful in growing their enterprises. The findings not only indicate a strong growth dynamic in common bean trading, but also positive indication that women entrepreneurs have capacity and potential to grow their bean trading enterprises. This is a positive sign for entrepreneurship development in the common bean corridors.

Table 15: Number of common bean trading enterprises that have expanded their businesses.

	POOLED	GENDER		COUNTRY				
		Women	Men	Cameroon	Kenya	Rwanda	Tanzania	Zambia
COUNT	8	3	5	1	3	1	2	1

Unlike start-up capital, there was an increase in diversity of capital sources for expansion of trading enterprises. Although men still had access to more diverse sources of enterprise capital, the number of sources for women increased from two at start-up to five during business expansion (Table 16). Personal savings remained the most common source of business expansion capital, while business savings and bank loan emerged as the second most common sources of expansion capital. Project support seemed to play a lesser role in funding expansion compared to start-up, potentially indicating that such support is more geared towards new traders. Gender comparison during business expansion showed that all surveyed women enterprises relied on business savings and less on project and family as sources of expansion capital (Table 16). Men still relied more on personal savings, bank loan, and project support for expansion, but also business savings, group loans and other sources. Bank loans were prominent in Tanzania and Zambia, while personal and business savings were key in Kenya and Rwanda.

Table 16: Sources of trading business expansion capital

	POOLED	COUNTRY					GENDER	
		Cameroon	Kenya	Rwanda	Tanzania	Zambia	Men	Women
Personal savings	6	1	2	1	1	1	4	2
Bank loan	5	1		1	2	1	3	2
Business savings	5	1	1	1	2		2	3
Project support	4	1	2		1		3	1
Group loan	2	1			1		2	
Family	1			1				1
Other	1		1				1	

Table 16 show that as both men and women's bean trading enterprises grow, they tap into a diverse pool of financial sources for expansion, moving beyond the initial reliance on personal savings. They either have more financing options or become more attractive to a variety of lenders and investors. The results also indicate that women's enterprises can access a wider range of financial sources as they establish their market presence and creditworthiness. The persisting importance of personal savings as a critical source of business expansion and emergence of business savings underscores the role of internal financing in growth of trading enterprises. Additionally, shifting landscape away from project support suggests a more organic growth of established trading businesses. The diversification of financing at expansion and changing financing landscape demonstrate development of bean trading enterprises in common bean value chain across countries. Thus, with the right financial conditions, women traders can overcome initial barriers and successfully expand their enterprises.

4.2.3 Impact of pandemic on trading enterprises

Traders also indicated how quantities of bean traded changed during or after coronavirus pandemic (Table 17). Out of the six enterprises that responded, one reported a decrease in trade volumes, four reported an increase, and one reported no change. Except for one trader in Tanzania and another in Rwanda who reported that quantities traded remained same and decreased, respectively, their counterparts in Kenya, Cameroon, and Zambia reported an increase in trading volumes. Another trader in Tanzania also experienced an increase in trade volumes during or after coronavirus pandemic.

Disaggregation of the results by gender showed that one women's enterprise reported a decrease in trading volumes, another reported an increase, while another reported the volumes remained the same during or after coronavirus pandemic. 100% of men traders reported an increased trading volume, suggesting that, men's bean trading enterprises have either greater resilience or better access to coping mechanisms (e.g., robust supply chains, greater financial reserves, or more effective business strategies) compared to women's trading enterprises. Conversely, women's enterprises could be more vulnerable to market access or supply chain disruptions caused by the pandemic. These results suggest possible gender differences in level of business development of men and women trading enterprises, provoking interventions that would bolster capabilities of women's enterprises to respond to economic challenges.

Table 17: Number of bean trading enterprises that reported changes in quantities of bean traded during or after COVID-19

	POOLED	COUNTRY					GENDER	
		Cameroon	Kenya	Rwanda	Tanzania	Zambia	Men	Women
Decreased	1			1			0	1
Increased	4	1	1		1	1	3	1
Remained same	1				1		0	1

4.3 Constraints to trade in common bean

Figure 6 visualizes various constraints reported by bean traders in 5 countries that participated in trader survey. Limited access to credit (3 traders) was the most frequently reported constraint, underlying the bottlenecks in acquiring the financial resources necessary for trading activities. Two traders reported low volumes, low demand, and cross-border trade restrictions as constraints. These constraints possibly affect traders the ability of traders to sell their products and complicated international trade and affect their business operation and profitability. Less frequently mentioned constraints were storage pest, low quality, inadequate credit, high grain and seed prices, and post-harvest losses. Although not mentioned frequently, these constraints have significant operational implications that can impact product quality, profitability, and business sustainability.

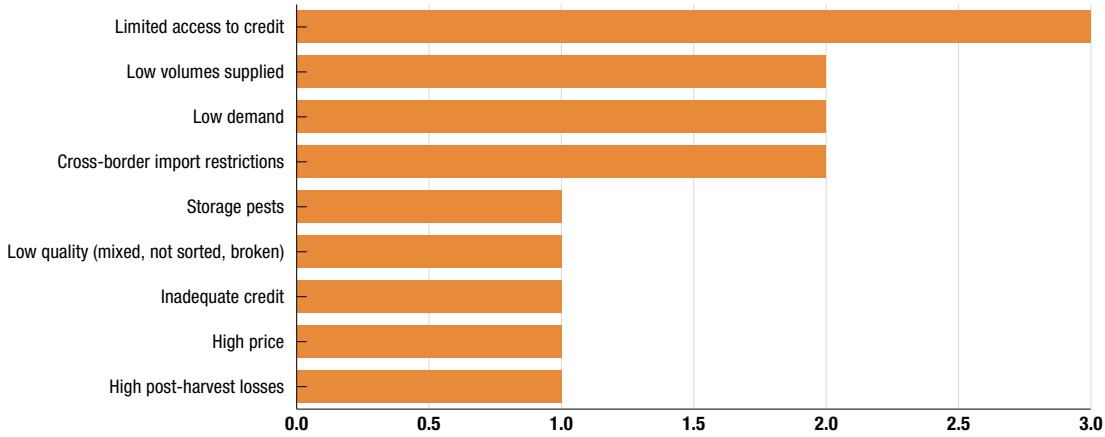


Figure 6: Constraints reported by bean traders across countries.

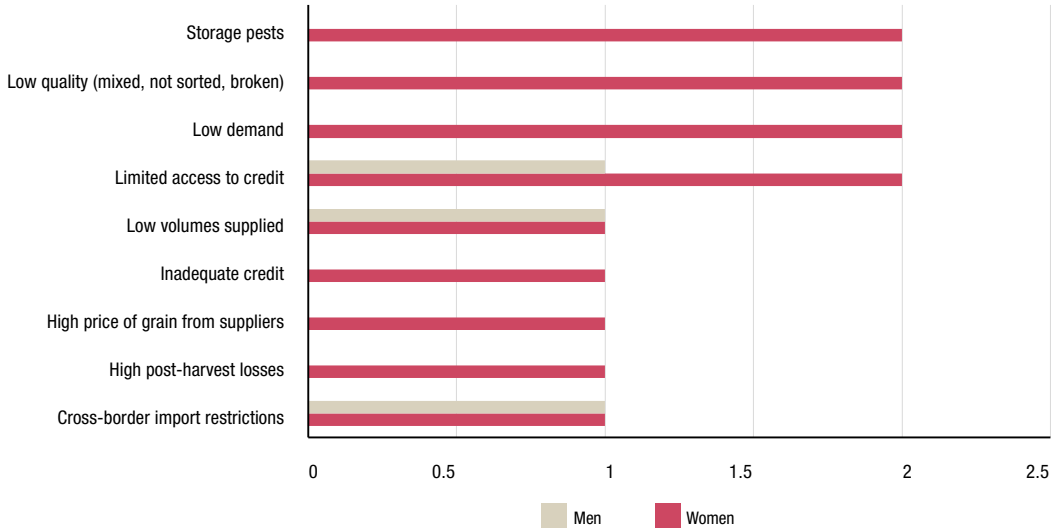
Further analysis of results by country as presented in in Table 18 highlighted salient observation. Traders in Kenya report a wide array of issues, including high post-harvest losses, limited access to credit, low demand, low quality of products, low volumes supplied, and storage pests than traders in other countries. In contrast, traders in Rwanda reported the least number of constraints, only mentioning high price of grain from suppliers and low demand. Although traders in Zambia and Tanzania reported an equal number of constraints (3), two them were similar – cross-border import restrictions and limited access to credit – while two were dissimilar – inadequate credit (Tanzania) and low volumes (Zambia). Notwithstanding, credit is an outstanding issue for traders in Kenya, Tanzania, and Zambia, signalling a need for improved financial services.

Table 18: Constraints reported by bean traders across countries.

Constraint	Kenya	Rwanda	Tanzania	Zambia
Cross-border import restrictions			1	1
High post-harvest losses	1			
High price of grain from suppliers		1		
Inadequate credit			1	
Limited access to credit	1		1	1
Low demand	1	1		
Low quality (mixed, not sorted, broken)	1			
Low volumes supplied	1			1
Storage pests	1			

Results in Figure 7 shows that limited access to credit, low supply volumes, and cross-border restrictions were common constraints for both men and women traders, which are systemic challenges that might operational capacity and profitability of bean trading enterprises. However, some constraints were gender specific. For example, storage pests, low quality, low demand, inadequate credit, and post-harvest losses were only reported by women traders, indicating need for gender-sensitive interventions.

Figure 7: Constraints reported by seed producers by gender.



4.4 Current and future needs of traders

Table 19 presents both current and future needs for traders in five countries. Access to capital was a universal need for traders across the countries. Except for Tanzania, technological needs are also common across all countries. Marketing need was mentioned by traders in Cameroon, Kenya, and Zambia. Traders in two countries (Cameroon and Zambia) and two in Kenya and Rwanda mentioned managerial and technical as currents, respectively. All surveyed traders identified technological needs in the future, emphasizing the current need for technology adoption and integration in businesses. Except for traders in Cameroon, traders in Kenya, Tanzania, and Zambia mentioned financing as a future need, reinforcing the idea that financial constraints are a persistent issue. Need for management skills in the future were only mentioned by traders in Cameroon. Market needs are recognized in all countries except in Rwanda and Zambia, suggesting that traders in Kenya, Cameroon, and Kenya expect improvement in market access. Improving technical capabilities in the future was identified by traders in Tanzania and Rwanda.

Table 19: Needs of traders by country.

	Cameroon	Kenya	Rwanda	Tanzania	Zambia
Current needs					
Financial	1	3	1	1	1
Technological	1	1	1		1
Market	1	1			1
Managerial	1				1
Technical		1	1		
Future needs					
Technological	1	1	1	1	1
Financial		1	1	1	1
Market	1	1		1	
Technical			1	1	
Managerial	1				

The data in Table 20 outlines the assessment of current and future needs of traders by gender. Both men and women traders currently report a need for technological, marketing support, and financial support. This is possible in acknowledgement of the role of technology, strategic marketing, and expansion of trading operations. While women mentioned technical needs in the current business environment, men mentioned managerial needs. Women traders might be facing immediate challenges related to hands-on practical aspects of their trading operations while men traders could be experiencing challenges related business administration, strategic planning, or personnel management. This reflects differences is issues related to operational and managerial aspects of men and women trading enterprises, respectively. The currents needs are also a reflection of the future needs for both men and women traders.

Table 20: Needs of traders by gender.

	CURRENT NEEDS		FUTURE NEEDS	
	Women	Men	Women	Men
Technological	2	2	3	3
Market	1	2	2	1
Managerial		2		1
Financial	3	4	3	1
Technical	2		2	

05.

Processing enterprises profile and development

5.1 Profile of processing enterprises

5.1.2 Processor characteristics by county

The demographic and business profile of the seven bean processors are shown in Table 21. There were no women processors in Cameroon and Zambia, suggesting a men dominated node in bean value chain in the two countries. In contrast, bean entrepreneurs in Kenya, Tanzania, and Uganda were all women, suggesting a gender-inclusive environment or a particular attraction of the common bean value chain for women entrepreneurs. Analysis of the age of the entrepreneurs showed no young entrepreneurs in bean processing, with 4 elderely and 3 adult seed processors.

Flour and grain are the most processed bean products across the countries. Processors in 4 of the 5 countries process grain. Tanzania had the highest diversity of processed products, processing flour, grain, canned beans, and cake. Processors in Kenya also had a relatively diverse portfolio of products – flour, grain, and snack. The product portfolio was narrow in Cameroon (flour), Uganda (flour and snack), and Zambia (flour and grain). These results show that processors in Tanzania process both basic and more specialized products like canned beans and cake compared to other countries. Additionally, processors in Kenya have substantial innovation of products but to a lesser extent compared to Tanzania. This reflects varying degrees of innovation and product diversification in the bean processing industry across these countries.

Furthermore, Tanzania exhibits a comprehensive market reach, possibly because of a broad portfolio of processed bean products. Processor in Tanzania sell to local, regional, and national markets, alongside specific sectors like hospitals, schools, and government. Processors in Kenya also distribute processed bean products through a variety of channels. Distribution network for bean products in Cameroon include kiosks/shops and distributors and local and regional markets. Uganda (local markets and hospitals) and Zambia (local markets and schools) had the least number of markets for processed bean products. The distribution of procressed bean products in Uganda and Zambia is community-centric, focusing on education institutions and schools. In contrast, the wide range of markets in Kenya and Tanzania indicates well-developed and diverse markets in the two countries.

Table 21: Profile characteristics of common bean processors

	CAMEROON	KENYA	TANZANIA	UGANDA	ZAMBIA	POOLED
Gender of entrepreneur						
Women	0	2	1	1	0	4
Men	1	0	0	0	2	3
Age of entrepreneur						
Adult	1	1	1	0	0	3
Elderly	0	0	1	1	2	4
Nature of business (formal)	1	2	1	1	2	7

	CAMEROON	KENYA	TANZANIA	UGANDA	ZAMBIA	POOLED
Bean products						
Flour	1	2	1	1	1	6
Grain	0	2	1	0	1	4
Snack	0	1	0	1	0	2
Canned bean	0	0	1	0	0	1
Cake	0	0	1	0	0	1
Market of the products						
Kiosks/shops	1	1	1	0	0	3
Local markets	1	2	1	1	1	7
Regional markets	1	0	1	0	0	2
Distributors	1	1	1	0	0	3
Hospitals	0	1	1	1	0	3
Hotels	0	1	0	0	0	1
Schools	0	1	1	0	1	3
Government	0	0	1	0	0	1
National markets	0	0	1	0	0	1

5.1.2 Processor characteristics by gender

Comparison of processed products show that women processors manufactured a wide range of bean product than men entrepreneurs. While women processors manufactured flour, grain, snack, cake, and canned bean (Figure 8). Men have a significantly lesser presence, only visible in flour and grain products and completely invisible in other processed products (Figure 8). These results reveal possible gender-specific product niches, which could be attributed to skill-based or market-driven factors and cultural influence. Additionally, these findings indicate potential areas for increased men involvement for business growth. These results also provide valuable insights for policy makers for gender equality interventions to address potential barriers and support equitable participation in processing segment of the value chain.

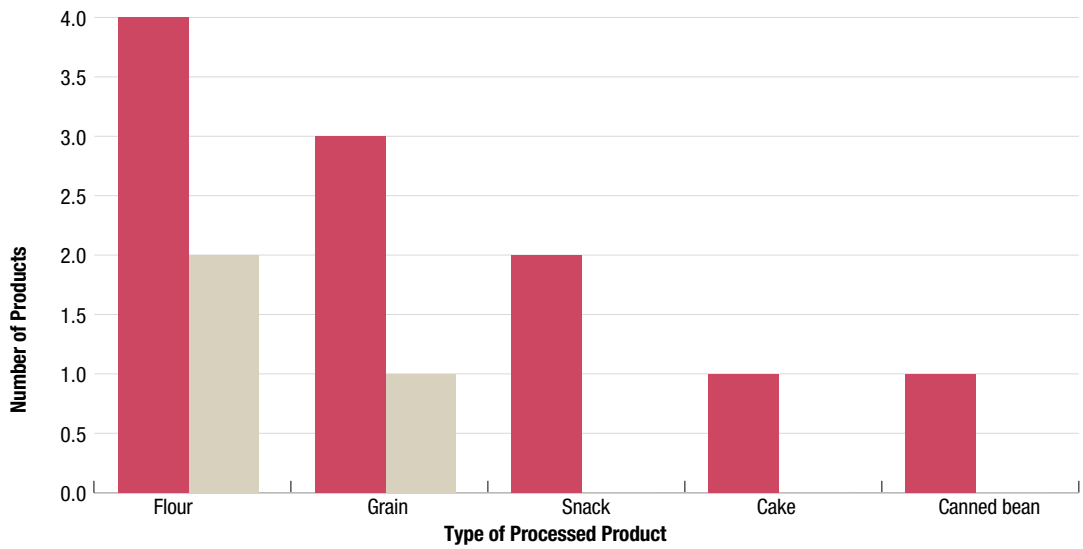


Figure 8: Type of processed by bean products by gender.

The gendered differences in product portfolio are further exhibited in the diversity of markets of the products as shown in Figure 9. Women sold the products in 9 markets compared to 5 markets utilized by men processors. The results indicate a strong presence of women processors in local markets, suggesting their strong focus on community-based markets. However, their exclusive engagement in several markets than men could be a reflection gender differences in specialization or preferences for diverse markets. In addition, the results could suggest gender-based division in market engagement. There was a balanced gender representation in regional markets. As mentioned, these results provide opportunities for gender-inclusive market development across bean production corridors in Eastern, Central and Southern Africa.

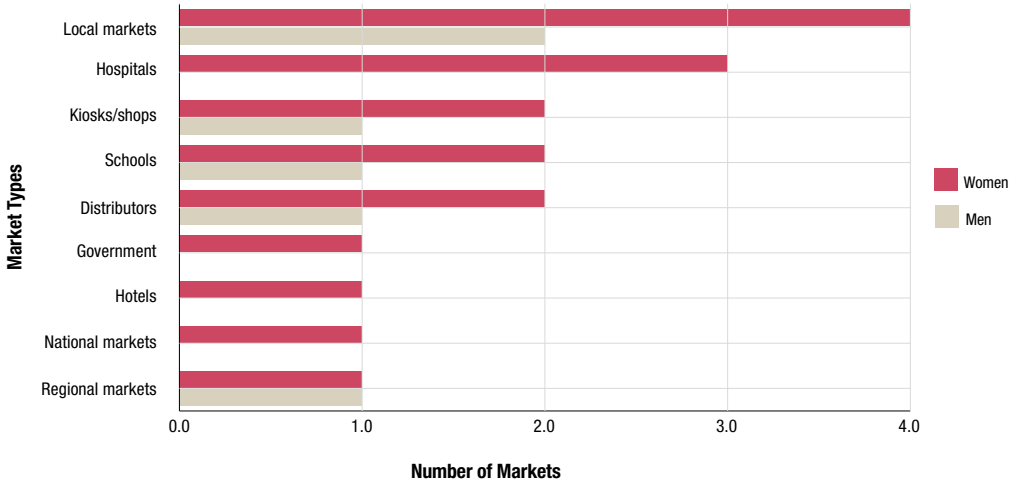


Figure 9: Type of markets of bean products by gender.

5.2 Development of common bean processing enterprises

5.2.1 Processor start-up capital

Table 22 shows the amount of start-up capital for processors, disaggregated by country and gender. For entrepreneurs who reported start-up capital, women processors in Kenya reported $262,397, the most substantial start-up capital across countries. Women entrepreneurs' investment in bean processing enterprises in Tanzania ($470) and Kenya ($6,384) was modest relative to women in Kenya. In Zambia, the men invested $74,414 to start bean processing enterprises. The overall total start-up capital for women-owned enterprises was $132,912 compared to $74,414 for men-owned enterprises suggest women are not only owning but also significantly investing in bean processing enterprises, which is a promising trend of women's investment capacity in one of the most lucrative segments in common bean value chain.

Table 22: Amount of start-up capital of processors by country and gender

	POOLED ($)	WOMEN ($)	MEN ($)
KENYA	262,397	262,397	
TANZANIA	470	470	
UGANDA	6,384	6,384	
ZAMBIA	74,414		74,414
TOTAL	113,413	132,912	74,414

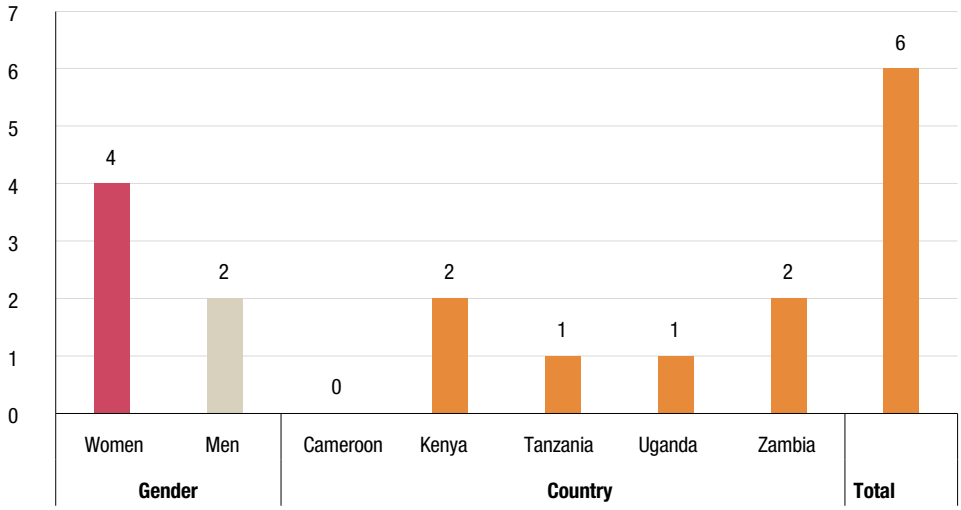
Table 23 provides information on the different sources of start-up capital for common bean processors by country and gender. Like other actors in the common bean value chain, personal savings were the most reported source of start-up capital as reported by six of the seven sampled processors across the countries. While processors in Kenya accessed bank loan and project support to start their bean processing enterprises, those in Zambia had family and friends as source of initial capital. Cameroon, Tanzania, and Uganda did not report any sources other than personal savings. Both women and men equally reported using personal savings as a source of start-up capital. Whereas women reported using bank loan and project support as other sources of initial capital, men obtained start-up capital from family or friends. These results show that self-financing is critical source of financing during the initial stages of business development for bean processors.

Table 23: Sources of start-up capital for common bean processors (count)

	POOLED	COUNTRY					GENDER	
		Cameroon	Kenya	Tanzania	Uganda	Zambia	Men	Women
Personal savings	6	1	1	1	1	1	3	3
Bank loan	1		1					1
Family/friends	1					1	1	
Project support	1		1					1

The number of processors who reported expanding their enterprises are is presented in Figure 10. Six of the seven surveyed processors affirmed that they expanded their businesses. 100% of women processors and 2 surveyed men processors (all in Zambia) reported expanding their businesses. The processor from Cameroon reported did not report business expansion. The 100% enterprise expansion among women processors suggests that women processors are successfully growing their businesses and could be benefiting from a supportive environment for female entrepreneurs.

Figure 10: Number of processors that have expanded their businesses.



5.2.2 Expansion capital of processing enterprises

Personal capital remained a dominant source of capital for expansion of processing enterprises just like at start-up (Table 24). The other sources of enterprise expansion capital remained unchanged from those at initial stages of business development, but business savings (for processors in Kenya) and group loan (for processors in Uganda and Tanzania) emerged as new sources capital at expansion stage. Women had more diverse sources of expansion capital (4 sources) compared to men (3 sources). The results indicate that as processors grow their enterprises there is a shift in the types of financing used, tending to move towards reinvesting earned profits (business savings). These results could guide development of financial services and support programs tailored to needs of processors at different stages of business growth.

Table 24: Sources of expansion capital for bean processors (count)

	POOLED	COUNTRY					GENDER	
		Cameroon	Kenya	Tanzania	Uganda	Zambia	Men	Women
Personal savings	5	1	1	1	1	1	2	3
Business savings	3		2			1	1	2
Project support	2		1					2
Family/friend	1					1	1	
Group loan	1			1	1			1

5.2.3 Impact of pandemic on processing

Analysis of quantities of bean products processed before and after the Covid-19 are presented in Table 25. There was an overall decrease in number and volumes of processed bean products across countries in the aftermath of Covid-19. There was also a complete cessation of product lines, such as bean cake and canned beans during and after the pandemic. Country level (Annex I) and gender (Annex II) comparisons of the results in Table 25 indicates a similar downward trend in volumes of bean products processed between the two periods. Disrupted supply chains, decreased demand, or operational restrictions imposed during the pandemic possible affected the operational capacity due to difficulty in sourcing raw materials, a fall in consumer demand, or logistical challenges caused by lockdowns and restrictions. These suggest low resilience capacities of bean processing enterprises which undermines enterprise development.

Table 25: Quantities of bean processed by processors before and after COVID-19.

	Before Covid-19 (kg/month)	During/after Covid-19 (kg/month)
Bean flour	6,630	4,500
Snacks	2,600	250
Cake	150	
Canned beans	70	
Grain	14,073	3,343

The number of employees engaged by processors before and after the Covid-19 was also considered as a measure of enterprise development. Table provided shows changes in numbers of employees by common bean processors before and after the COVID-19 pandemic. There was an increase in the total number of employees from 13 before COVID-19 to 18 during or after, suggesting resilience or even growth among bean processors in terms of employment. The highest growth occurred in Zambia and among men-led bean processing enterprises. Employment was stable in Tanzania indicated by 11 employees

before and during Covid-19. Unlike reductions in processing capacity, the processing enterprises had the capacity to develop and grow even in the face of significant global economic disruptions, a positive outlook for a potential continued entrepreneurship development.

Table 26: Number of employees before and after Covid-19

	POOLED	COUNTRY				GENDER	
		Cameroon	Kenya	Tanzania	Zambia	Men	Women
Before Covid-19	13	14	12	11	14	14	12
During/after Covid-19	18	19	14	11	23	21	13

5.3 Constraints to bean processing

In Table 27, high cost of grain, limited access to finance, lack machinery, and quality assurance were cross-cutting constraints across the countries. High cost of grain suggest that bean processors are significantly impacted by raw material prices. Financial constraint across the countries is likely to impact the ability of processors to invest in capital improvements, manage cash flow, and respond to market opportunities. The mechanization of processing operations could possibly have a negative implication on efficiency, productivity, and quality. Similarly, the bean processors across countries may be experiencing challenges related to meet the existing quality standards due to technological or financial limitations.

Table 27: Constraints reported by bean processors across countries.

	POOLED	KENYA	TANZANIA	UGANDA	ZAMBIA
High cost of grain	6	2	1	1	2
Lack/limited access to finance	5	2	1	1	1
Availability of grain	4	1	1		2
Lack of machinery	4	1	1	1	1
Storage	4	1	1		1
Market differentiation	3	1	1	1	
Poor grain quality	3	1	1		1
Quality assurance	3	1	1	1	1

The mention of availability of grain, storage, and poor grain quality as constraints specifically by bean processors in Kenya and Tanzania suggests several country-specific issues. Grain availability constraints is an indication of potential supply chain issues that may be unique to Kenya and Tanzania. Storage challenges in the two countries could reflect inadequacies in storage facilities and technologies that may further have negative ramifications for overall quality grain of the final bean products. Grain quality concern in both Kenya and Uganda may be attributed to challenges with maintaining consistent quality standards from the point of harvest to processing that could linked to the storage constraint.

The results presented in Table 28 show constraints experienced by bean processing enterprise by gender. Except for market differentiation constraint that was only mentioned by women processors, both men and women processors reported high cost of grain, limited access to finance, lack of machinery, storage, grain availability and quality, and quality assurance as constraints. These shared concerns point to systemic challenges that could be addressed through industry-wide strategies to improve the operational environment for bean processors. Regardless of shared challenges, women processors face a unique challenge related to creating and maintaining distinct market position, underlining the importance of gender-responsive entrepreneurship development in bean processing industry.

Table 28: Constraints reported by bean processors by gender.

	WOMEN	MEN
High cost of grain	4	2
Lack/limited access to finance	4	1
Lack of machinery	3	1
Market differentiation	3	
Storage	3	1
Availability of grain	2	2
Poor grain quality	2	1
Quality assurance	2	1

5.4 Current and future needs of processors

Processors in Cameroon only need financing both in the current period and in the future (Table 29). In contrast, financing, marketing support, and technological and technical support are needed by bean processors in Kenya, Uganda, and Zambia currently and in the future. Except for Uganda, bean processors also need managerial support. The overarching need for financing across countries underscores the critical role of capital in both establishing and scaling bean processing operations. Marketing, technological, and technical support needs could also be an indication of the complex business environment in which bean processors operate. By focusing on these needs, processors are seeking to not only sustain but also grow and compete in the market in the future.

Table 29: Needs of bean processors by country.

	CAMEROON	KENYA	TANZANIA	UGANDA	ZAMBIA
Current needs					
Financial	1	2	1	1	2
Market		2	1	1	1
Technological		2	1	1	1
Managerial		1	1		1
Technical		1	1	1	1
Future needs					
Financial	1	2	1	1	1
Managerial		1	1		1
Market		2	1	1	
Technical		1	1	1	1
Technological		2	1	1	1

Disaggregation of processors needs by gender revealed similarities in needs of men and women processors currently (Table 30). However, there were gender differences in future needs with women processors reporting more needs than men processors. Specifically, women entrepreneurs need financial, marketing, technological, technical, and managerial support in the future. However, more of them lean towards financial (4), technological (4), and managerial (4). In contrast, men processors only mentioned financial, technological, and managerial needs. These results suggest that while current needs among male and female bean processors are aligned, looking to the future, women anticipate a broader and more intensive set of needs to sustain and grow their businesses. These could be underlined by women anticipating business growth into the future, gendered barriers to entry and scaling, multifaceted roles of women entrepreneurs, and resource gaps. The narrow men's needs in future could possibly be that they

are more focused on scaling existing operations than broadening their marketing reach or enhancing their technical skills.

Table 30: Assessment of needs of bean processors by country.

	CURRENT NEEDS		FUTURE NEEDS	
	Women	Men	Women	Men
Financial	4	3	4	1
Market	4	1	2	
Technological	4	1	4	1
Technical	3	1	3	
Managerial	2	1	4	1

06.

Discussion of result and solutions to entrepreneurs' constraints and needs

6.1 Seed Production

The exploration of seed production enterprises within the common bean value chain in Chapter 3 reveals critical insights into the entrepreneurial landscape of this agricultural sector. Despite challenges, there is an evident upward trajectory in employment rates across various countries, signalling growth and expansion within the industry. Notably, Kenya's substantial increase in seed enterprise employment points to a thriving seed industry, likely buoyed by conducive business climates and robust market demand. Gender disparities in seed production are pronounced, with women-owned enterprises generally demonstrating less start-up capital and fewer instances of business expansion compared to their male counterparts. However, there has been significant progress in women's entrepreneurship, particularly in nations like Rwanda and Tanzania, where women-led enterprises are successfully scaling their operations.

The reliance on personal savings for start-up capital across both genders underscores the critical need for improved access to finance, which could catalyse further development and growth in seed production. Furthermore, the diversification of funding sources during business expansion, especially among women entrepreneurs, reflects a positive shift towards greater financial inclusion and empowerment in the industry. Overall, Chapter 3 captures the dynamism of the seed production sector, highlighting the interplay between entrepreneurial growth, gender dynamics, and the imperative for tailored financial strategies to foster an equitable and robust agri-business ecosystem.

6.2 Trading Enterprises

Chapter 4 offers a comprehensive look at bean trading enterprises, bringing to light the disparities and development potentials within the sector. Men traders typically begin with a substantial advantage in start-up capital, yet the chapter documents a commendable rise in business expansion among women traders, hinting at a slow but positive shift toward gender parity in the trading sphere. The reliance on personal savings for initial capital underscores a significant gap in financial services that cater to the needs of traders, particularly women. As businesses mature, the diversification of capital sources for both genders indicate a dynamic trading environment where women are starting to bridge the capital access divide. The pandemic's effects on trade volumes varied, with men's enterprises generally showing resilience, possibly due to established support mechanisms. Conversely, women's enterprises exhibited vulnerabilities to disruptions, suggesting a need for more robust support structures to bolster women's economic agency in trade. In essence, Chapter 4 sheds light on a sector where growth and equality are budding, albeit unevenly. It advocates for strategic support to ensure that women traders are equipped not just to survive but to thrive and compete on an equal footing in the bean trading industry.

6.3 Bean processing Enterprises

Chapter 5 provides profiles and development trajectories of bean processing enterprises, revealing a nuanced landscape of growth, innovation, and challenges. A notable gender divide is observed, with women leading the charge in Kenya, Tanzania, and Uganda, indicating a gender-inclusive or particularly

appealing sector for women entrepreneurs. In contrast, the absence of women processors in Cameroon and Zambia points to potential areas for gender inclusivity efforts. The chapter highlights the industry's maturity, with seasoned entrepreneurs at the helm, suggesting that experience plays a pivotal role in the sector's success. Product diversification emerges as a key theme, with Tanzania standing out for its broad portfolio, indicating a high degree of innovation and market responsiveness among its processors. Analysis of enterprise financing reveals significant gender disparities in start-up capital, with women in Kenya showcasing remarkable investment capabilities. This financial momentum among women processors is critical for fostering growth and innovation in the sector. Despite the impact of the COVID-19 pandemic leading to decreased processing volumes and the cessation of certain product lines, the increase in employment numbers post-pandemic suggests a resilient sector poised for recovery and growth. However, the industry faces systemic challenges, including access to raw materials, financing, and technology, which are exacerbated for women processors, highlighting the need for targeted support and interventions. The chapter underscores the bean processing sector's dynamic and evolving nature, marked by gender disparities, innovation, and resilience. It calls for an inclusive approach to address the barriers faced by women processors, ensuring equitable growth and development within this crucial segment of the agri-food system.

6.4 Solutions for entrepreneurship development

A cross-cutting issue was no involvement of young entrepreneurs in seed production, trading, and processing enterprises within the common bean value chain. This observation points to a significant gap in the agri-food sector's engagement with younger demographics, which could have implications for innovation, sustainability, and long-term sector growth. The absence of young entrepreneurs highlights potential barriers to entry, such as access to finance, land, and markets, as well as possibly insufficient support for youth interested in agribusiness.

Enterprises in the common bean value chain confront several constraints which impede scale of operations. Seed producers have limited access to pre-basic and basic seed, limiting their seed production capacity. Bean seed producers are also constrained by limited access to land compared to crops like maize due to a lower seed multiplication factor (Farrow & Muthoni-Andriatsitohaina, 2021). Poorly organized markets, insufficient supply, inadequate processing capacity, financing, poor grain quality, and inability to respond to specific short-term demands are among constraints that impact trading and grain processing enterprises in SSA (Farrow & Muthoni-Andriatsitohaina, 2021). These challenges disproportionately affect small and medium-sized enterprise, especially those owned and operated by women entrepreneurs.

Based on the study findings , entrepreneurship needs, and constraints the following are proposed as solutions:

- Educational initiatives, mentorship programs, and start-up grants to address technical and financial obstacles to youth engagements and to incentivize investment in the value chain operations.
- Capacity building, access to resources, and women knowledge sharing platforms and networks to enhance gender inclusivity.
- Financial support, investment in processing technologies, and quality control mechanisms to address cross-cutting, country-specific, and gender-specific constraints to entrepreneurs.
- Inclusive business development services to address unique needs of different entrepreneurs through training, market access information, and mentorship. Provide mentorship and incubation programs for young entrepreneurs to gain practical experience and insights from established business owners.

07.

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08.

ANNEXURES

Annex I: Quantities of bean processed by processors before and after COVID-19 by country.

	BEFORE COVID-19				DURING/AFTER COVID-19				
	Kenya	Tanzania	Uganda	Zambia	Cameroon	Kenya	Tanzania	Uganda	Zambia
Bean flour	15,000	1,500	650	-	1000	15000	1200	800	-
Snacks	5,000	-	200	-	-	-	-	250	-
Cake	-	150	-	-	-	-	-	-	-
Canned beans	-	70	-	-	-	-	-	-	-
Grain	8,105	80	-	40,000	-	7500		2500	30

Annex II: Quantities of bean processed by processors before and after COVID-19 by gender.

	BEFORE COVID-19		DURING/AFTER COVID-19	
	Women	Men	Women	Men
Bean flour	8,038	1,000	5,667	1000
Snacks	2,600	-	250	-
Cake	150	-	-	-
Canned beans	70	-	-	-
Grain	5,430	40,000	5,000	30

END