Business Model for Community-Based Sheep Breeding in Ethiopia

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Executive Summary:

- Community-based breeding programs (CBBP) can address the challenges associated with accessing improved genetics. CBBP helps livestock keepers to access high-quality breeding stock.
- The experience so far in Ethiopia is that the CBBPs have been externally designed, with active participation of farmers, and highly supported in many ways by research institutions and extension offices.
- We formulated a comprehensive business model that details the different aspects related to the establishment, management, and financial feasibility of a community-based sheep breeding business (CBSBB) in three locations.
- In this business model, we emphasize a shift in perspective from externally driven group-based development of CBBPs to entrepreneur-led and profit-oriented sheep breeding programs.
- The three locations are Bonga, Doyo Gena, and Menz. These are areas where the technical and economic feasibility of CBBP has been tested for more than a decade.
- The business will focus on production and sales of high-quality and improved breeding stock, artificial insemination service, pregnancy testing services, stud fees, fattened rams, training, and consultation services.
- Customers of the business are primarily local smallholder farmers, breeders who are engaged in sheep breeding local livestock cooperatives and associations, government organizations, and non-governmental organizations (NGOs).
- The business will be successful only if the customers are satisfied. Entrepreneurs need to strive to establish a close and collaborative relationship with their customers, with a focus on customer retention by meeting their needs and expectations.

- Existing CBBPs, large-scale farms, and other service providers are potential competitors. Growing demand for meat and ethically sourced products presents opportunities for expansion.
- The main product of this business is breeding stock. This stock is well-maintained, certified and is fully documented. This gives confidence to potential buyers as awareness of the pedigree is an important consideration in selecting rams for breeding.
- The business is projected to generate income in the first year and is financially feasible based on positive net present value and high internal rate of return.

Introduction

Small ruminant community-based breeding refers to a breeding program managed and implemented by business-oriented livestock keepers, aiming to improve the genetic potential of their small ruminant populations. The community-based breeding program is well suited for intensive market-oriented farming and requires a small breeding flock.

According to the Central Statistical Agency, Ethiopia's total sheep and goat population is estimated at 95.4 million, where 42.9 million are sheep and the remaining 52.5 million are goats (CSA, 2021). This abundance of animals contributes significantly to the country's economy and food security. Livestock farming is critical to meeting the population's dietary demands and provides work for many Ethiopians, particularly in rural areas. These indigenous small ruminant breeds have adapted to their surroundings and have characteristics that make them resistant to adverse situations like drought and disease. This genetic diversity ensures the survival of these animals and serves as a significant resource for future breeding initiatives aimed /at improving their performance.

Small ruminant production in Ethiopia is characterized by its low productivity due to, inter alia, limited access to improved genetics, poor nutrition, inadequate healthcare, lack of access to finance, and lack of knowledge on proper animal management practices. Community-based breeding programs (CBBP) can address the challenges associated with accessing improved genetics. CBBP helps livestock keepers to access high-quality breeding stock.

There is a wealth of scientific evidence on the benefits of CBBP in different parts of Ethiopia. The demand for improved CBBP breeding sires, and other products such as meat animals, and ultrasonography is very high. However, there is no self-motivated entrepreneurship around CBBP in the country. Therefore, we formulated a comprehensive business model that details the different aspects related to the establishment, management, and financial feasibility of a community-based sheep breeding business (CBSBB) in three locations. The three locations are Bonga, Doyo Gena, and Menz. These are areas where the technical and economic feasibility of CBBP has been tested for more than a decade.

The Purpose of the Business Model

The experience in Ethiopia so far has been that community-based breeding programs are designed and implemented within the framework of enabling farmers to select the right rams/bucks and reproduce their sheep/goat population as efficiently as possible. Breeder cooperatives in the CBBPs have been engaged in improved sire production to sell/be used by their members and surplus sires sold to producers close to the CBBPs and other areas. Producers always acquire breeding rams from the CBBPs and all the male animals born and non-selected animals for the CBBPs will be linked to a fattening unit. So, the current approach involves breeders, producers, and fattening cooperatives with the role of producing improved sire, meat animals, and finished lambs, respectively. In addition, non-replacement females can also be sold to other farmers as improved stock. The programs were externally designed, with active participation of farmers, and highly supported in many ways by research institutions and extension offices. These public investments can only take CBBPs so far.

In this model, we emphasize a shift in perspective from externally driven group-based development of CBBPs to entrepreneur-led and profit-oriented sheep breeding programs. Therefore, by “community”, we are referring to a community or group of entrepreneurs. This group could be farmers, non-farming entrepreneurs, or a mix of both. The model is however designed within the context of rural Ethiopia based on the empirical evidence we have generated in three sites for more than 10 years.

The quality of the animals produced through CBBP, especially the sheep rams, has become very popular in and around the three sites. Hence, this demand from livestock keepers and other consumers can be used to reorient the approach so that entrepreneurs can make a profit from it. This business model is therefore targeting a group or groups of entrepreneurs that are interested in sheep breeding through selection from within the population in their surroundings. This model is different from models that have individual entrepreneurs in mind. If resources allow, a community-based sheep breeding business (CBSBB) can also be done at the individual entrepreneur level. This is however highly unlikely a possibility in rural Ethiopia given the resource limitations people must live with. We discuss the model below with this background.

Products and Services:

This business model aims to improve the quality and productivity of sheep, which in turn can lead to various products for sale. These may include the production and sales of high-quality and improved breeding stock, artificial insemination service, pregnancy testing services, stud fees, fattened rams, training, and consultation services to help other farmers and entrepreneurs optimize their breeding practices and maximize the productivity of their sheep flock.

Customers of the products and services of the business

Customers for the community-based sheep breeding business (CBSBB) are primarily local smallholder farmers, breeders who are engaged in sheep breeding local livestock cooperatives and associations, government organizations, and non-governmental organizations (NGOs) - especially when they have projects around livestock development. Additionally, this business can also supply fattened live animals, meat products, and products that target individual consumers, hotels, supermarkets, retailers, wholesalers, and exporters.

- **Smallholder farmers**: farmers are always in need of high-quality breeds of livestock. The experiences so far have shown that there is a very high demand among farmers for breeding rams. One hurdle in targeting smallholder farmers is the financial struggle they might have to pay for the breeding rams. It is therefore important to encourage smallholder farmers to buy the rams in groups. Farmers will be the largest group of consumers for the improved breeding stock for this business.

- **Local livestock cooperatives and associations**: there are livestock cooperatives and associations established by livestock keepers in different parts of the country. These associations aim at increasing the production and productivity of their animals. Hence, they always try to bring the best genetic resources into their population and would like to apply various innovations to enhance productivity. They have always been among the top customers of the breeding stock from community-based programs. Though limited in number these associations will be the most reliable customers for this business.
- **Governmental and Non-Governmental Organizations (GO and NGO)**: both governmental and non-governmental institutions have been purchasing breeding rams from the community breeding programs to distribute in their intervention areas. These purchases are unpredictable in terms of the quantity demanded and the timing of the purchase. However, whenever they happen, they are rewarding to the breeders and serve as positive shocks to the system. These organizations will therefore be an important market outlet for the breeders. Yet, entrepreneurs need to understand the unique nature of these customers and design their interactions accordingly. Keeping these customers interested requires active engagement and continuous promotion of the products to the organizations. A tailored marketing strategy needs to be followed to ensure that bureaucratic procedures are not standing in between the business and these institutional buyers.
- **Meat consumers:** CBSBB will also supply sheep for meat consumers. Consumers of meat are expected to be seasonal so that the demand increases during religious and cultural holidays. Therefore, sheep breeding businesses must synchronize their selection and fattening activities to have an economically optimal level of supply to the market on different holidays. A carefully designed marketing strategy will be

necessary to make the most out of this group of customers, who usually pay higher per animal than other customers because of their inability to postpone their purchasing decisions.

Customer Relationships

The relationship to be established between this breeding business and the customers listed above is going to be the key factor that determines the viability of the business. The business will be successful only if the customers are satisfied. Entrepreneurs need to strive to establish a close and collaborative relationship with their customers, with a focus on customer retention by meeting their needs and expectations. This can be achieved by regularly engaging with customers to understand their preferences and feedback. The business should also ensure that its products are of high quality and meet industry standards. The business will establish and maintain its relationship with customers based on the three principles of acquiring, keeping, and growing customer base.

i. Acquire

The breeding business needs to invest in identifying and recruiting customers from different parts of the market. A clear description of the types and qualities of the products and services of the business is the first task to accomplish. Then, the unique characteristics or the value proposition of the production process and/or the products and services need to be packaged in a way that is accessible to potential customers. Then, platforms need to be created to promote the products and services as effectively as possible. Methods that can be used in promoting the products and services of the breeding business include business site visits, demonstrations at agriculture exhibitions and local fairs, informational programs on mass and social media platforms, flyers and posters, and short message service.

ii. Keep

Once customers are acquired, the business needs to keep the relationships with customers strong and growing. The business needs to have regular and informative communication with its customer base to keep them interested and engaged in the business' production and marketing activities. The business might also offer special discounts or incentives for loyal customers who continue to use its products and services. The business needs to have follow-up support services for those customers who are buying breeding stocks. This helps customers to have confidence in the products and services rendered by the business and distribute any risk that they might envisage in purchasing the breeding stock.

iii. Grow

The business needs to always strive to increase its customer base commensurate with the rate at which it produces the goods and services. The key to growing the customer base lies in a combination of effective marketing strategies, carefully designed customer service, and continuous improvement in product and service offerings. It involves expanding the business's reach through partnerships and collaborations with other businesses, and networking with livestock associations, local farmers, community leaders, influencers, and suppliers. Another effective strategy for growing the customer base is implementing customer loyalty programs and incentives in areas where the current customer is limited while the potential is high.

Target Market Description

This business model is developed considering the circumstances in three sites, namely, Bonga, Doyo gena, and Menz areas, where the sheep production systems are considerably different. The markets that can be targeted by the CBSBB are those that can be accessed by small businesses in these locations. CBSBBs in Bonga have a larger market potential because of the proximity and accessibility of the big towns such as Bonga, Jima, and Mizan. Doyo Gena also has considerable potential because of its high population density and proximity to large cities such as Wolaita Sodo. Menz is also an area where improved genetic resources and sheep breeding services will have high marketability. The site is known for its highly preferred sheep population, and it is very close to the large livestock markets in Debre Birhan and Addis Ababa.

The most important market in all sites is, however, the sheep-keeping community within the locations. Improved rams are scarce commodities throughout the country. We expect farmers to be the most important consumers of the products of the breeding business, at least in the short run. Similarly, similar businesses will be the main consumers of the improved sheep breeding services to be provided by such a business. Service, other than the breeding ram, provision will, however, be rewarding only for those who invest in it ahead of others.

The rest of the products and services of CBSBB could be marketed within and outside of the location in which the business is situated.

Market size

The demand for meat is generally growing in Ethiopia because of the increase in human population and the improvement in living standards. The strong positive trends in small ruminant prices for decades now indicate the rising demand for the animals.

The size of the market for locally reared livestock has shown significant growth in recent years, driven by the increasing consumer demand for ethically sourced and sustainable products. Consumers are becoming more aware of the environmental and social impact of their food choices and are willing to pay a premium for locally sourced meat that meets their values and expectations. The demand for selectively bred livestock is expected to continue to expand, presenting even more opportunities for entrepreneurs involved in these community-based breeding businesses.

These cooperatives could be strong competitors for the breeding businesses this model is meant to serve. However, the cooperatives can also partner with the new breeding businesses which are to be established for profit-making purposes. This business model can also be used by the current CBBP groups and cooperatives to reorient their activities to profit maximization rather than increasing productivity.

In Bonga, there are 16 licensed CBBP cooperatives and 4 unlicensed cooperatives, 1 youth fattening group, and a few other groups that are producing livestock and are in the process of forming a cooperative and obtaining a license.

There are 8 licensed CBBP cooperatives in Doyo Gena, including 1 women-only cooperative that engages in both production and breeding. In addition, 5 cooperatives are producing small ruminants currently applying for licenses.

In Menz Gera, there are 3 licensed CBBPs and 7 production cooperatives waiting for licenses. In Menz Mama, there are 2 CBBP and 5 production cooperatives. In Menz Lalo Midir, 3 production cooperatives supply improved animals to CBBPs.

At national level, currently there are 146 livestock CBBP with 73,000 breeding females. With biological assumptions of 1.55 offspring born per lambing breeding female annually, 90 % lamb survival to selection age, and a selection proportion of 0.5 and 5% culling for physical characteristics producing, 2 ram -service years and 5% ram mortality in CBBPs resulted in 22,687 sires for production unit (Haile and Getachew, 2022). These sires are then sold to production cooperatives or units with ratio of a ram to 25 breeding females and assuming a ram serves for 2.5 years, serving 1.4 million breeding female sheep annually, and able to produce 1.01 million finished males per year, and helping 284,000 households (Haile and Getachew, 2022).

Description of Competitors

The type and intensity of competition a CBSBB faces depends on how it is formed and where it is located. If it is an existing CBBP that transforms itself into a more profit-oriented CBSBB, then the competition from other CBBPs will be lower compared to a completely new breeding business. Similarly, a CBSBB that is to be established close to other CBPPs will face intensive competition from the breeding programs. Therefore, CBSBBs to be established need to consider their distance and potential market share vis-à-vis the size of the existing CBBPs.

There are other product and service-specific competitors that entrepreneurs of CBSBB could face. Regarding mutton, there are limited but large-scale commercial farms that supply fattened or regular sheep to the different markets. The CBSBBs will have to invest in their unique attributes so that they will remain competitive in an environment where these large-scale farms dominate.

The competition around mutton could also come from farm households who keep livestock with controlled and well-managed feeding and health regimes. Although few, there are farmers who are producing high-quality animals using local resources. These farm households are not too many to be a threat yet. However, it is important to note that farmers are changing their husbandry practices to produce good-quality animals.

CBSBBs are also expected to provide some services to other similar businesses. For instance, pregnancy tests will be an important service for livestock keepers in rural areas. However, it might be very difficult for the breeding businesses to make any profit out of such services unless the location is carefully selected.

We present below an **analysis of the competition in the sheep breeding business** in Ethiopia using Porter's Five Forces Model. This Model provides a comprehensive framework for assessing the competitive dynamics in any industry.

i. Threat of New Entrants

For CBSBB, the threat of new entrants is relatively low in Ethiopia. This is primarily due to the specialized knowledge and resources required to successfully operate in this industry. Breeding high-quality sheep with desirable traits and ensuring their health and well-being demands expertise and experience that cannot be easily replicated by newcomers. Additionally, particularly for the CBSBB to evolve from CBBPs that have been operating for a while, the strong relationships and trust built between the breeders and the local community will be a significant barrier for new entrants. Trust and partnerships take time to develop and cannot be easily achieved by newcomers.

ii. Rivalry among Existing Firms

The competition among existing CBBPs is fierce. Due to their closeness to each other and the limited market they can access, cooperatives are competing for a larger share of the market, and they constantly strive to differentiate themselves from other cooperatives and competitors. The same level of competition is expected between existing breeding cooperatives and newly established CBSBBs. This will be the case especially if the location of the new CBSBBs overlaps with the existing CBBPs and the species of animal they are working on is similar.

iii. Threat of Substitute Products

Focusing on the key products, the threat of substitutes in the CBSBBs is relatively low. Unlike other industries where consumers have a wide range of alternatives to choose from, community-based breeding offers unique and specialized services that are difficult to replicate. As a result, the threat of substitute products is minimal, giving the existing cooperatives a competitive advantage in the market. However, some services the breeding businesses are planned to provide could easily be made available by other agencies, in fact at a more competitive price.

iv. Bargaining Power of Buyers

The bargaining power of buyers is low due to reasons including a lack of information on the existence and potential benefits of improved rams, their small size relative to the sellers of the improved animals, and their rigid purchasing calendar that limits their ability to postpone their marketing decision. The limited availability of substitute products, particularly for the improved rams, further reduces the bargaining power of buyers. As a result, the businesses can maintain higher prices and more favorable terms, contributing to their overall profitability.

v. Bargaining Power of Input Suppliers

The number and types of input suppliers for improved sheep production, particularly for the sheep breeding business, are very limited. This makes the inputs market, a sellers' market. Feed and veterinary services are scarce in rural Ethiopia and hence these breeding businesses will have to incur considerable costs to access these inputs. This will then push the prices up making the businesses less competitive in the markets.

Value Proposition

The key value proposition of this business is its selection of high-quality animals from the local sheep population. These animals are not only the best in terms of the most important attributes being considered for selection, but they are also well adapted to the environment and would withstand any challenges that externally introduced breeds might struggle with. The main product of this business is breeding stock. This stock is well-maintained, certified and is fully documented. This gives confidence to potential buyers as awareness of the pedigree is an important consideration in selecting rams for breeding. Another important feature of this business is that it is established in rural areas by a group of entrepreneurs drawn from the rural community, and therefore the institutional conduct of the business will have a positive impact on the perception of local animal genetic resources and collective action.

Marketing Strategy

To succeed in the Market, the four Ps of marketing - product, promotion, price, and place - must be considered. The products of the business should be unique and competitive in terms of price. In this case, the improved rams and their offspring shall satisfy the needs and tastes of the intended market. The goal of promotion should be to draw attention to the special qualities and advantages of the products and services while also building brand recognition through successful advertising and PR initiatives. Prices should be reasonable while reflecting the value that the product offers, considering issues like market demand

and production expenses. The distribution channels utilized to reach the target market are referred to as "place," and they should be quick and simple for customers to access.

i. Products

Products and services in the CBSBB range from sales of high-quality and improved breeding stock to stud fees. Artificial insemination, pregnancy testing services, fattened improved rams, training, and consultation services are among the key merchandise of CBSBBs.

ii. Promotion

Promotion plays a crucial role in CBSBB, as it helps to raise awareness about the available products and services. Various promotional strategies can be employed based on the type of customer targeted, followed by developing a unique selling proposition and selecting the most effective promotional channels. The channels could be Short Message System or SMS, Radio broadcasts, newspapers or print advertising, and social media. It is also important to track and measure the effectiveness of each promotional effort to make informed decisions about future marketing investments.

iii. Price

Another important aspect is pricing. Setting the right price for products is crucial for attracting customers and maximizing profits. This requires careful analysis of production costs, market demand, and competitor pricing. In addition, conducting market research and surveys can help gather valuable insights into customer preferences and their willingness to pay. This information can guide the pricing strategy and ensure that the products are competitively priced while still maintaining profitability. Furthermore, offering flexible pricing options such as discounts for bulk purchases or seasonal promotions can also attract a larger customer base and increase sales.

iv. Place or distribution

When considering the place or distribution for CBSBBs, it is important to identify locations that are easily accessible to the target market. This could involve setting up breeding centers in strategic locations within the community or partnering with local businesses to distribute the breeding products. Additionally, establishing an online presence through e-commerce platforms can expand reach and make it convenient for customers to access the breeding services from anywhere.

The following figures (Figures 1 to 4) show the market channels for the products and services of currently functioning CBBPs in the three locations. The CBSBBs to be established will certainly have the same channel probably adding more outlets down the line.

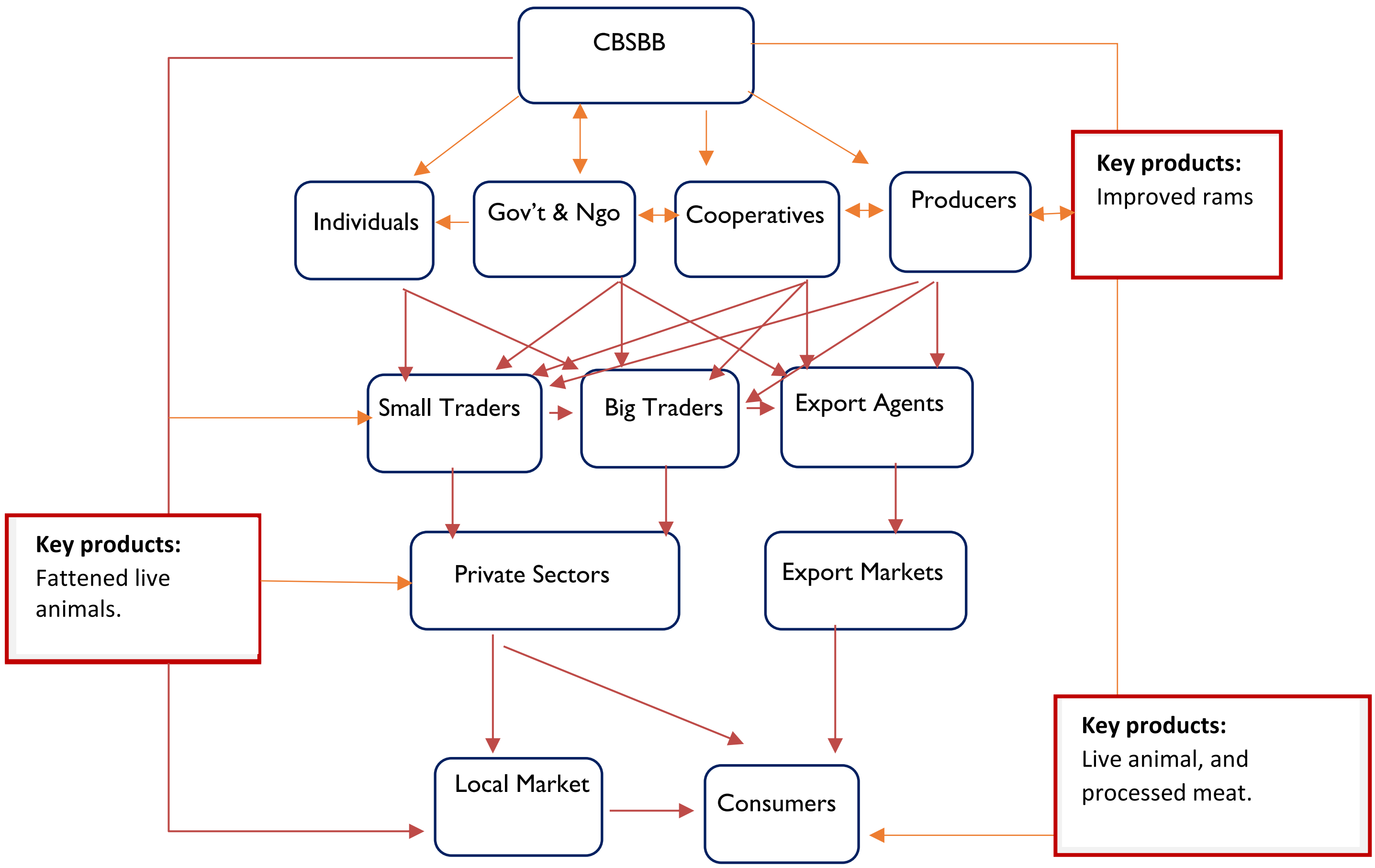


Figure 1: Market Channel for Improved Rams and Meat Animals from CBSBB

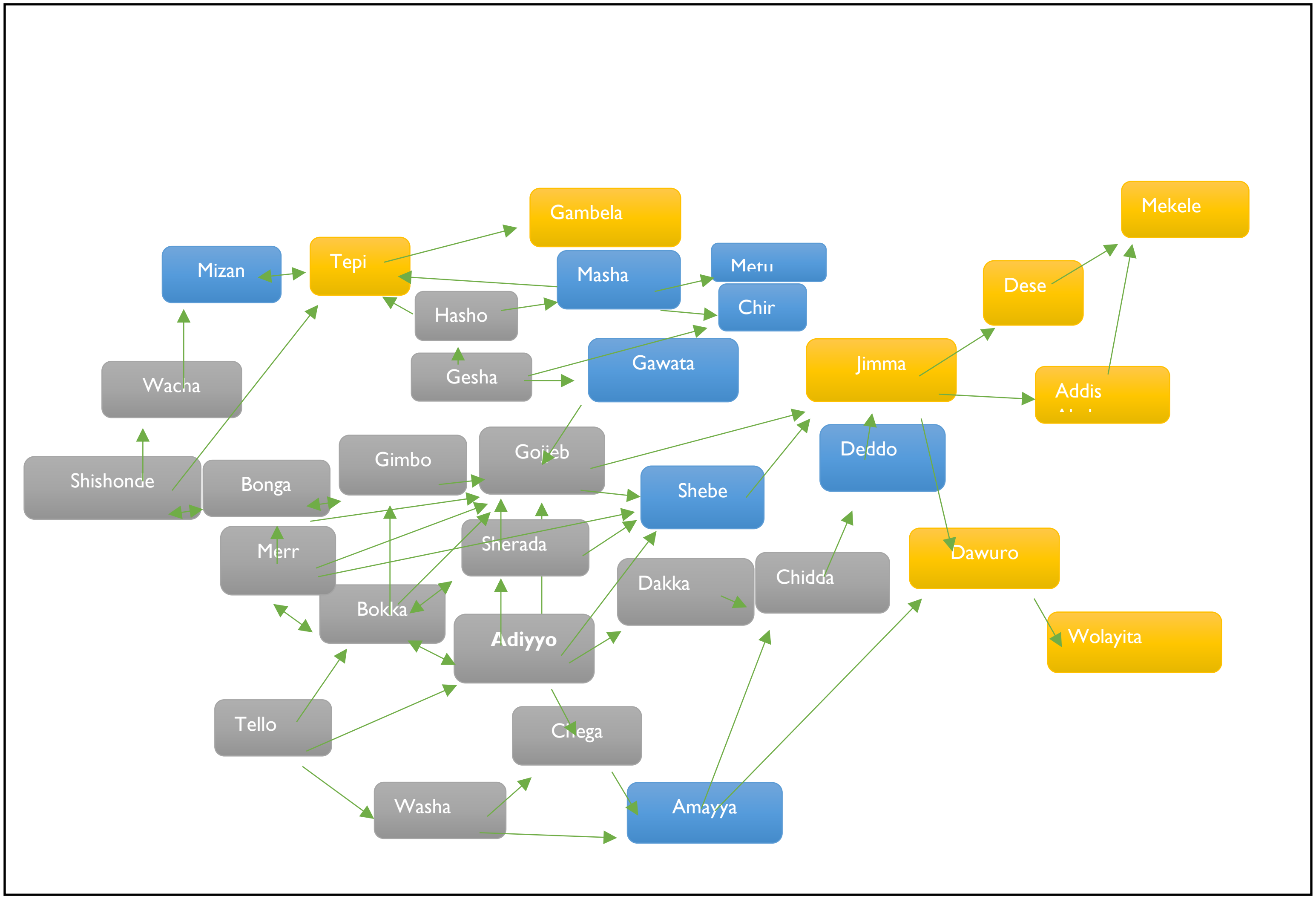


Figure 2: Market routes for small ruminants in Bonga

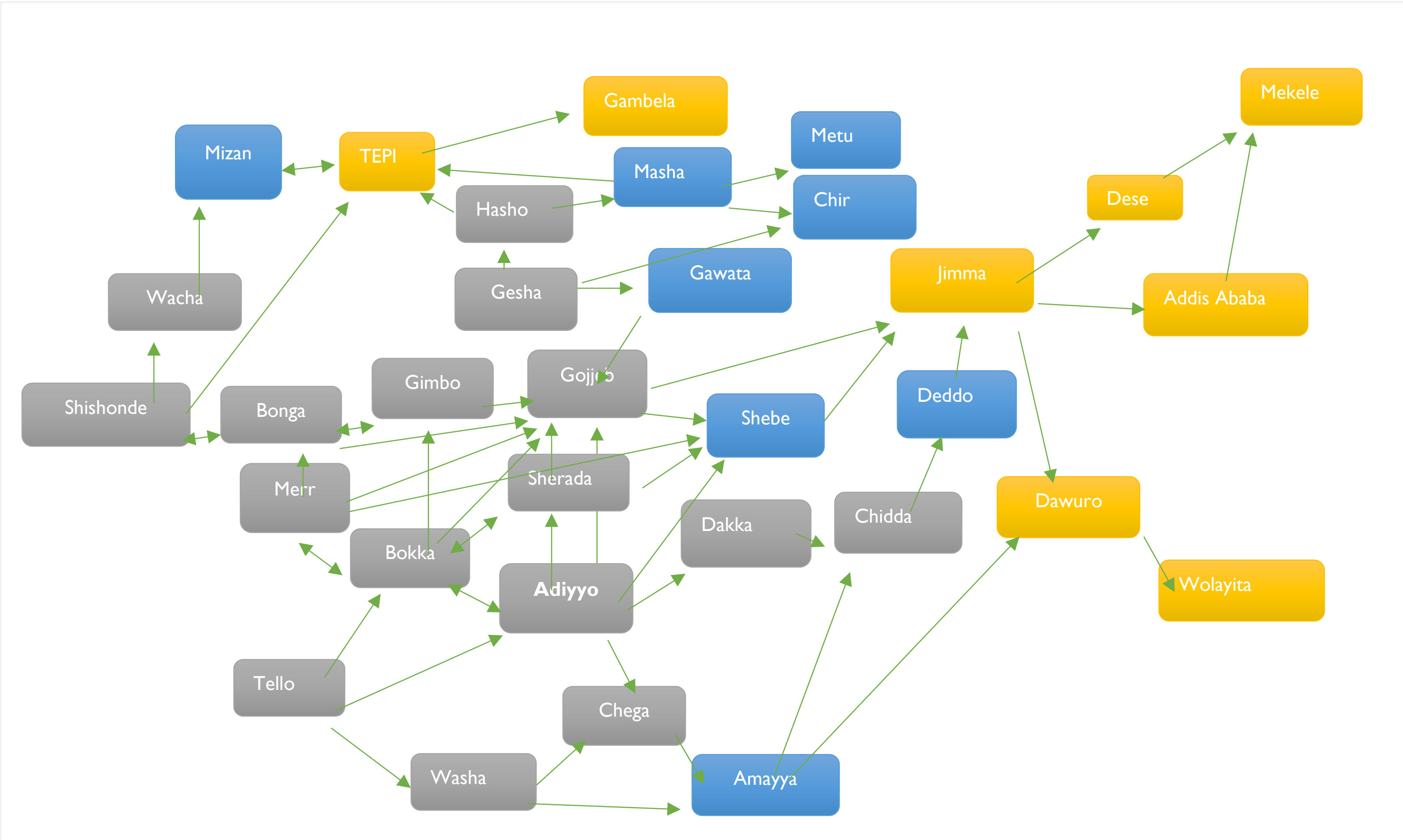
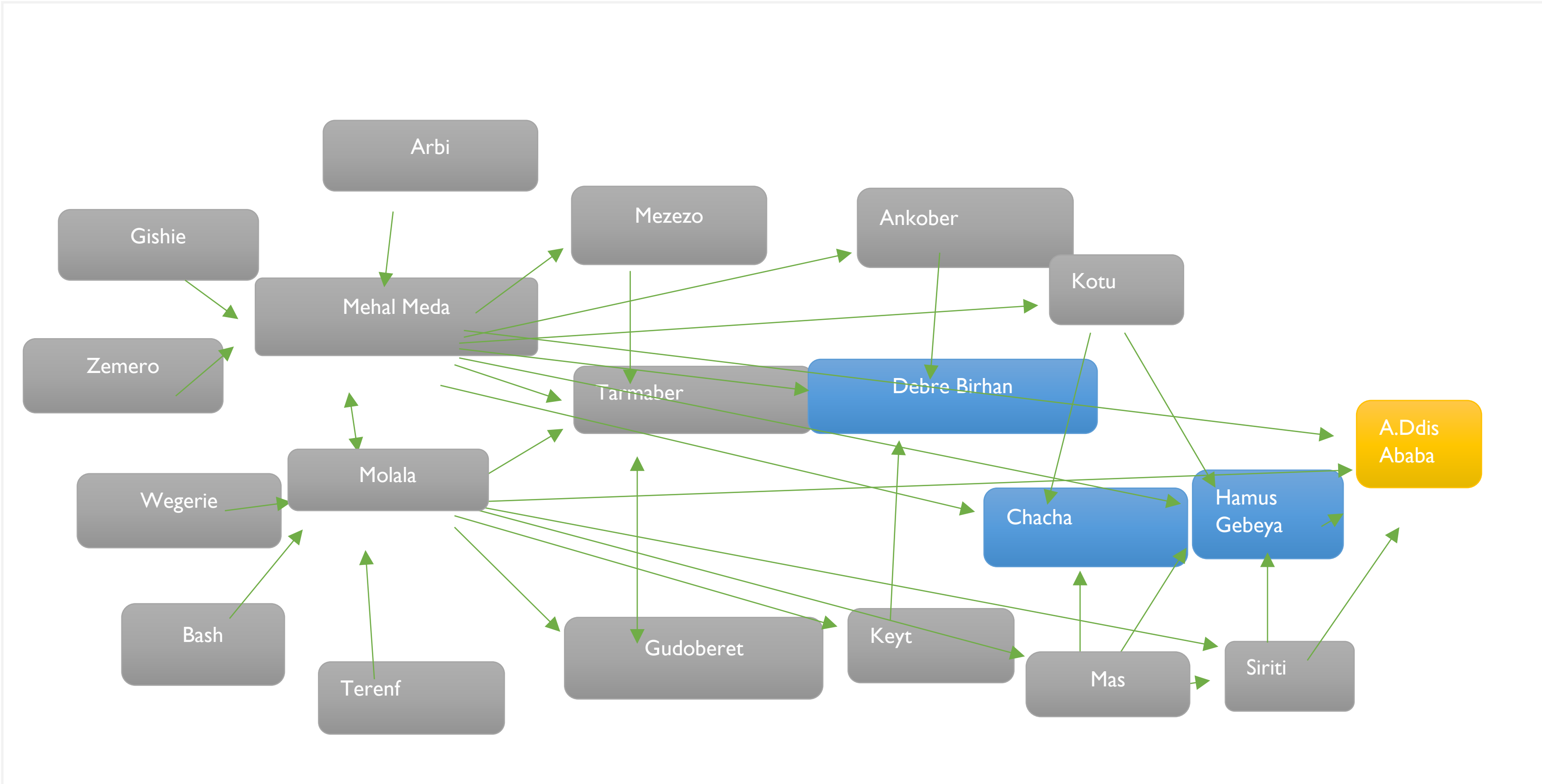


Figure 3: Market routes for small ruminants in Doyo Gena



Primary *Secondary* *Terminal*

Figure 4: Market routes for small ruminants in Menz

Revenue Streams

This business will generate revenue by providing high-quality breeding stock or offspring to individuals or organizations who are interested in improving their sheep production or breeding. By offering exceptional genetics, the business establishes itself as a reliable source of superior animals. Additionally, the services, such as stud fees, artificial insemination, pregnancy test services, and providing fattened high-quality meat, manure, training, and consulting services will be sources of revenue for the business. These revenue streams are directly tied to the business value proposition of delivering top-notch sheep genetics and comprehensive support to breeders. This drives revenue for the business and fosters long-term partnerships with customers of breeding stock who see the business as an invaluable resource and solidifies its reputation in the market. This, in turn, attracts more livestock keepers and associations seeking to improve their breeding programs, creating a sustainable and thriving ecosystem within the industry.

This business model emphasizes the provisions meant for expanding the production line so that the entrepreneurs exploit the opportunities that value addition presents to sheep breeders. The additional lines of production include fattening, producing high-quality meat and byproducts, slaughtering and processing facilities, packaging, and providing marketing support. Entrepreneurs can increase their revenue by diversifying their product offerings and targeting different market segments as well.

Resource and Management

In this section, we discuss the resources and management mechanism to establish and run a CBSBB profitably.

- **Human resources**: working with others has its challenges and opportunities. A business will be successful if it manages to withstand the challenges and exploit the opportunities that arise from collective breeding and marketing. This entails well-trained and experienced personnel not only to run the routine operations but also to manage the business partnership as well. Hence, entrepreneurs to start CBSBB need to bring qualified workers on board.

- **Cooperative formation:** forming a cooperative will enable farmers to collectively make decisions and implement strategies that will enhance the breeding business. This allows better coordination in breeding efforts, sharing of knowledge and experiences, and access to collective bargaining power when it comes to selling their livestock on the market. The cooperative will have members of the executive committee and will designate a chairman, accountant, enumerator, and procurement officer.
- **Veterinary services**: pooling animals together increases the risk of disease and pests among the livestock owned by the business. Sharing sheds, feed, and water creates a conducive environment for disease and pest transmission. There is a need for more intensive and continuous veterinary services. Unless the location warrants reliable access to veterinary services, the entrepreneurs need to hire permanent or temporary veterinary service providers to ensure that their business survives and remains profitable.
- **Physical resources**: carefully built and managed shelters or barns, water and feeding troughs, dips, and crushes are necessary to have a competitive community-based breeding business. Given the small herd size in rural households and the economic despair of the rural youth, constructing these structures at the individual household or entrepreneur level might not be feasible. Therefore, it is advised in this model that the structures need to be constructed at the group level.
- **High-quality breed**: the cooperative prioritizes sourcing high-quality breeds for their animals from the available population. They carefully evaluate various factors such as genetic traits, health records, and performance history to ensure that only the best animals are chosen. Additionally, these high-quality breeds are more resilient to diseases and environmental stressors, further contributing to the overall health and well-being of the animals improving the overall quality of their livestock, and maximizing the benefits for the farmers.

- **Breeding equipment and tools**: this is a breeding business that depends on the selection of the best-performing animals from within the local sheep population. Therefore, investment needs to be made in essential breeding equipment such as AI kits, breeding records, pregnancy test tools, and ultrasound scanners.
- **Quality feed and water**: this business can succeed only if the animals are well-fed. Expression of the genetic potential of the sheep is possible only if sufficient feed and water of the right quality are provided. Identification and mixing of the feed might need professional engagement from animal feed experts.
- **Partnerships with academic and research institutions**: breeding small ruminants as a business is a very challenging endeavor. Entrepreneurs need professional support in establishing the partnership, establishing practical and fair management systems, managing and maintaining the group dynamics, resource use efficiency, financial management skills, risk management, and marketing. Partnership with academic and research institutions would be the cheapest option for these businesses, at least at the three sites of focus. In cases where these institutions are not able to provide the services that the businesses need, private actors and/or individuals can be hired to get the services. The business will have to consider the costs associated with soliciting and hiring the required expertise.
- **Financial resources:** starting up a sheep breeding business entails financial investment higher than related businesses, such as sheep fattening, that can be established by an individual entrepreneur. Access to financial capital is a critical challenge to small-scale entrepreneurs, as traditional financial institutions have prohibitive requirements that make it difficult for rural startups to get access to their services. Instead, entrepreneurs can explore alternative financing options, such as Banks or Microfinance institutions, credit associations, self-help groups, and grants to get access to financial resources. However, accessing the required financial capital can be useful only if the business has the right financial management system in place.

Key Activities

This section presents the key set of activities that need to be accomplished in establishing and running a profitable small ruminant breeding business.

- **Group/community formation**: this business is best established and run by a group of entrepreneurs with shared interests and trust. The shared interest is simply making profit out of sheep breeding. The issue of trust is, however, an important challenge that needs serious consideration and investment. The number of people to be part of the group and the level of investment in developing trust depends on the size of the business. Scientific research recommends that 500 breeding ewes need to be available to start (Gizaw, Komen and van Arendonk, 2009). There are usually two options to form community-based breeding programs. The first option is having a group of 100 entrepreneurs with 5 ewes each. This group will include 20 rams at a ratio of 1 ram to 25 ewes. The second option is having a group of 5 members with 5 ewes each, and one ram per group. This business model focuses on the first option. This ensures genetic diversity and allows for efficient breeding management within the business. Additionally, having smaller groups within the bigger group can also facilitate better communication and decision-making among the members. Establishing the group needs to be guided by a detailed bylaw and code of conduct within the framework of business partnerships. The selection of group members / business partners/ is the most important step in this business.
- **Establishing office:** as indicated above, regardless of the way the groups are formed, this is a business that involves many people in a rural setting. Hence, the entrepreneurs need an office to convene and discuss managing their business. Establishing an office requires, among others, identifying location, construction or renting, registration of the business, and management of day-to-day activities in the office. This is an important task for the smooth and effective management of the group business. This activity shall be undertaken before the business starts its

operation. If the business grows, the office will eventually grow into an all-in-one facility where the business can run its breeding, processing, and marketing activities.

- **Organization and structure:** Running a successful community-based sheep breeding business requires effective networking and coordination among farmers. This includes registrations, drafting bylaws, and establishing clear roles and responsibilities within the cooperative can help streamline operations and ensure efficient decision-making such as organizing committees and appointing a chairman, accountant, enumerator, and procurement officer.
- **Breed selection and goals:** the selection of the initial stock for the community-based sheep breeding program needs to be done as carefully and as scientifically as possible. Sheep of the preferred attributes are selected from the local population. Acquiring genetically superior males helps jumpstart the breeding business and is crucial in achieving desired traits such as high fertility, disease resistance, and meat quality. The selection of the animals for the breeding business should be done in such a way that it ensures that the business starts with healthy and genetically superior animals for better productivity and profitability. Additionally, by promoting the use of high-quality breeding stock, farmers can contribute to the overall genetic improvement of the sheep and goat populations in their region.
- **Training and capacity-building:** Identifying and collaborating with training institutions that could provide technical support (district livestock experts, research centers, universities, TVET local partners and NGOs) can empower rural entrepreneurs to become more knowledgeable and capable in their roles in breeding, animal care, marketing, and financial management. These organizations often have information on training programs and partnerships with TVET institutions that can provide technical support in areas such as animal care and breeding. Additionally, networking with local NGOs and community-based organizations that focus on agriculture and livestock can also help to identify training institutions that volunteer

their services to rural communities. Many entrepreneurs in rural areas may lack the necessary knowledge and skills to effectively care for and breed animals, leading to suboptimal outcomes.

- **Feeding and watering the animals:** the efficiency of feed and water management determines the viability of this business. Entrepreneurs need to realize that this is the most important cost line of the business once the initial investment costs are accounted for. Carefully selected and prepared feed and clean water must be made available to the animals to have a profitable breeding business. This business is not only producing breeding rams. Instead, it produces sheep for meat, as well as skin and manure. Therefore, the way the animals are fed will have a significant implication in the performance of the entire breeding program as a business. The business needs to establish regular monitoring and adjustment of feeding practices to optimize growth and development in animals, resulting in better quality products for the market.
- **Health management:** reliable and timely veterinary service is crucially important in smallholder-owned sheep breeding businesses. Disease prevention and control measures should be implemented to ensure that the animals remain healthy and productive. This includes regular check-ups, vaccinations, parasite control, preventive care measures to minimize the risk of disease outbreaks, and monitoring for signs of illness. Sick animals should be isolated and treated promptly to prevent the spread of disease. Regular cleaning and disinfection of equipment and facilities can go a long way to maintaining a healthy environment for animals. A veterinarian should be consulted for advice on disease prevention and control measures. By prioritizing health management, the business can minimize losses due to illness and maintain a profitable operation.
- **Record keeping and measurement**: collecting, organizing, documenting, and analysis of data on production and reproduction traits of animals is an important feature of breeding as a business. Record keeping is essential to monitor the

progress and performance of animals. It allows the business to track important data such as growth rates, reproductive success, and health indicators, enabling entrepreneurs to make informed decisions regarding breeding strategies and animal management. This involves identifying the animals that have the highest genetic merit. Proper record keeping can also facilitate access to financial services and support, as it provides evidence of the livestock and potential for growth.

- **Product sale and marketing:** to remain in business, this investment needs to have effective marketing strategies for its products and services. The level and continuity of profit generation from the business depend almost entirely on the way the marketing is designed and implemented. Identification of the types and preferences of consumers, selecting the best channel to reach out to the consumers, and targeting the high-demand seasons are among the key issues that the entrepreneurs need to invest in. Entrepreneurs need to establish a personal connection with their customers, build brand loyalty, and target higher prices for their products. This obviously requires a significant investment of time and resources, as entrepreneurs must handle all aspects of marketing, sales, and customer service by themselves.

Key Partners

Partnerships create a lot of opportunities for small entrepreneurs especially in the rural context where these breeding businesses are going to be based. Carefully crafted partnerships will help business owners to reduce costs and increase the efficiency of production and marketing. Partnerships help through improved access to information, distributed overhead cost of production and marketing, and increasing competitiveness in the market through economies of scale or bigger market presence. Therefore, sheep breeders need to plan for strategic partnerships that aim at improving the production and/or marketing of their products. Such businesses can partner with the following:

- Local farmers and breeders,
- Feed and input Suppliers,

- Local veterinary clinics and animal health professionals,
- Processors,
- Financial institutions,
- Distribution and marketing agencies,
- Cooperative and associations,
- Agricultural research institutions and universities
- Bureau of Agriculture, and
- Non-governmental organizations.

Cost Structure

The primary costs associated with operating a community-based sheep breeding program business include:

i. **Feed and water:** proper feeding systems and watering ensure that the animals receive a balanced diet and that their nutritional needs are met.

ii. **Procurement and maintenance of breeding stock:** This involves the initial purchase or acquisition of high-quality breeding animals. It is essential to invest in healthy and genetically diverse breeding stock to ensure the success of the business.

iii. **Ear tags and applicators:** These are necessary for the identification and tracking of individual animals within the business. Proper tagging and tracking are crucial for monitoring genetic diversity and measuring the success of the business in enhancing resilience in livestock populations. Additionally, ear tags and applicators need to be regularly maintained and replaced to ensure accurate data collection.

iv. **Animal scales:** Animal scales are essential for monitoring the growth and weight of individual animals in the breeding business. Regular weighing allows for the identification of any health issues or growth abnormalities, ensuring that only healthy and genetically robust animals are selected for breeding. Additionally, accurate weight records help in making informed decisions regarding nutrition and overall herd management.

v. **Veterinary care and medication:** Veterinary care and medication are crucial components of maintaining the health and well-being of animals in a breeding business. Regular check-ups, vaccinations, and treatments help prevent the spread of diseases and ensure that any health issues are addressed promptly. Additionally, access to necessary medications ensures that animals receive appropriate treatment for any illnesses or injuries they may encounter. Overall, veterinary care and medication play a vital role in promoting the overall success and sustainability of a breeding business.

vi. **Pregnancy testing tool:** Another important aspect of veterinary care in a breeding business is the use of a pregnancy testing tool. This tool allows breeders to accurately determine if an animal is pregnant, which helps in planning and managing the breeding business effectively. By using this tool, breeders can make informed decisions regarding breeding pairs and ensure the health and well-being of both the mother and potential offspring.

vii. **Insemination tool:** In addition to pregnancy testing, an insemination tool is another crucial component of a breeding business. This tool enables breeders to artificially inseminate animals, increasing the chances of successful breeding and genetic diversity. By utilizing this tool, breeders can carefully select and introduce desired traits into their breeding business, ultimately improving the overall quality of the offspring produced.

viii. **Housing:** Infrastructure development for housing and feeding the animals is essential in maintaining their health and well-being. Adequate housing facilities, such as barns or enclosures, provide a safe and comfortable environment for the animals to live in. This infrastructure development plays a crucial role in supporting the breeding program by creating optimal conditions for the animals' growth and reproduction.

ix. **Skilled personnel:** Hiring skilled personnel for animal management and breeding activities is essential for the success of the business. These individuals have the knowledge and experience to handle the animals properly, ensuring their well-being and maximizing their reproductive potential. They are also responsible for monitoring the animals' health, implementing breeding strategies, and maintaining accurate records. Their expertise greatly contributes to the overall success of the breeding business and helps ensure its long-term sustainability.

x. **Genetic testing and analysis:** help breeders identify any potential genetic disorders or health issues in their animals, allowing them to make informed breeding decisions and prevent the spread of undesirable traits. Additionally, genetic analysis can also provide valuable insights into the genetic diversity within a breeding business, helping breeders maintain a healthy and diverse population of animals.

xi. **Marketing and promotion:** help breeders showcase their animals to potential buyers and acquire, keep, and grow their customer base.

Financial analysis

To evaluate the commercial viability of the sheep fattening business, a thorough financial model has been developed. This section summarizes the assumptions related to costs and revenues of the business and the results of the financial analysis.

Methodology

The business is a community-based sheep breeding business to be established by a group of entrepreneurs.

- Revenue estimates are derived mainly from the sale of certified sires, fattened rams, male and female lambs, ewes, and manure.
- Project worth analysis is done using the current interest rate, i.e., 9.25%.

Key Assumptions

- The business will start with 500 female sheep and 25 breeding rams in one cycle of 8 months.
- Mortality rate is 3%
- Ram replacement rate is 50%
- Price of fattened sheep will increase by 38% per year.
- The purchasing cost of sheep will increase by 26% per year.
- The cost of other expenses (e.g., feed, veterinary costs, labor costs, utilities, etc.) will increase by 19% per year.

Financing Assumptions

- Interest rate: 9.25%
- Income tax is 35%.

Depreciation Rates

- Housing (renovating of existing building structure) = 5% per year.
- Office Furniture and Equipment = 20% per year.

Total Initial Investment Cost

- The costs in this document represent an average scenario for producers. Expenses will vary depending on the producer and their management decisions.
- The total initial investment cost of the project including working capital is estimated in the three intervention sites (Table 1).

Table 1: Total initial investment cost

Costs	Common costs	Bonga	Doyo Gena	Menz
Purchasing cost of livestock		1,500,000	1,500,000	1,250,000
Housing (renovating of existing building structure)	50,000			
Handling system	50,000			
Equipment	178,000			
Breeding ram	42,000			
Total initial costs	**320,000**	**1,820,000**	**1,820,000**	**1,570,000**

Financial Evaluation

According to the financial projection, the business should start generating income in the first year. The business' financial feasibility is demonstrated through parameters such as gross profit and net profit.

The net present value of the CBSBB is examined in the project feasibility analysis using a discount rate of 9.25 percent with the presumption that input costs and market prices for output will rise proportionately throughout the course of the program. A value greater than zero is regarded as acceptable when using the NPV criterion to evaluate an investment with the intention of making a profit. The positive and large NPV values (Tables 2 to 4 below), show that CBSBB is a financially feasible business.

According to this financial analysis, the program is expected to have an IRR of more than 75%, implying a higher rate of return on investment. As a result, this analysis shows that investment in community-based sheep breeding is financially rewarding.

Table 2: Financial analysis summary for sheep breeding in Bonga

Bonga											
Year		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Capital	100,000										
Income											
Market Sheep		7,369,713	10,170,203	14,034,880	19,368,135	26,728,026	36,884,676	50,900,853	70,243,178	96,935,585	133,771,108
Revenue		**7,369,713**	**10,170,203**	**14,034,880**	**19,368,135**	**26,728,026**	**36,884,676**	**50,900,853**	**70,243,178**	**96,935,585**	**133,771,108**
Expenses											
Feed costs		3,345,481	3,981,123	4,737,536	5,637,668	6,708,825	7,983,502	9,500,367	11,305,437	13,453,470	16,009,629
Veterinary costs		8,400	9,996	11,895	14,155	16,845	20,045	23,854	28,386	33,780	40,198
Other expenses		440,000	523,600	623,084	741,470	882,349	1,049,996	1,249,495	1,486,899	1,769,410	2,105,597
Purchasing cost of Sheep		1,600,000	-	-	-	-	-	-	-	-	-
Total Expenses		**5,393,881**	**4,514,719**	**5,372,516**	**6,393,293**	**7,608,019**	**9,053,543**	**10,773,716**	**12,820,722**	**15,256,659**	**18,155,424**
Gross Profit	**(5,493,881)**	**1,975,831**	**5,655,484**	**8,662,365**	**12,974,842**	**19,120,007**	**27,831,134**	**40,127,137**	**57,422,456**	**81,678,926**	**115,615,683**
Depreciation		2,500	2,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Profit Before Tax		**1,973,331**	**5,652,984**	**8,657,865**	**12,970,342**	**19,115,507**	**27,826,634**	**40,122,637**	**57,417,956**	**81,674,426**	**115,611,183**
Profit tax (35%)		690,665.87	1,978,544.52	3,030,252.74	4,539,619.57	6,690,427.52	9,739,321.75	14,042,923.11	20,096,284.51	28,586,049.14	40,463,914.15
Net Profit	**(5,493,881)**	**1,282,665**	**3,674,440**	**5,627,612**	**8,430,722**	**12,425,080**	**18,087,312**	**26,079,714**	**37,321,671**	**53,088,377**	**75,147,269**
Net Present Value (10%)		**99,001,050**									
IRR		**84.2%**									

Table 3: Financial analysis summary for sheep breeding in Doyo Gena

Doyo Gena	0	1	2	3	4	5	6	7	8	9	10
Capital	100,000										
Income											
Market Sheep		6,841,725	9,441,581	13,029,381	17,980,546	24,813,153	34,242,152	47,254,169	65,210,754	89,990,840	124,187,359
Revenue		**6,841,725**	**9,441,581**	**13,029,381**	**17,980,546**	**24,813,153**	**34,242,152**	**47,254,169**	**65,210,754**	**89,990,840**	**124,187,359**
Expenses											
Feed costs		3,345,481	3,981,123	4,737,536	5,637,668	6,708,825	7,983,502	9,500,367	11,305,437	13,453,470	16,009,629
Veterinary costs		8,400	9,996	11,895	14,155	16,845	20,045	23,854	28,386	33,780	40,198
Other expenses		440,000	523,600	623,084	741,470	882,349	1,049,996	1,249,495	1,486,899	1,769,410	2,105,597
Purchasing cost of Sheep		1,587,500	-	-	-	-	-	-	-	-	-
Total Expenses		**5,381,381**	**4,514,719**	**5,372,516**	**6,393,293**	**7,608,019**	**9,053,543**	**10,773,716**	**12,820,722**	**15,256,659**	**18,155,424**
Gross Profit	**(5,481,381)**	**1,460,344**	**4,926,862**	**7,656,866**	**11,587,252**	**17,205,134**	**25,188,609**	**36,480,453**	**52,390,032**	**74,734,181**	**106,031,935**
Depreciation		2,500	2,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Profit Before Tax		**1,457,844**	**4,924,362**	**7,652,366**	**11,582,752**	**17,200,634**	**25,184,109**	**36,475,953**	**52,385,532**	**74,729,681**	**106,027,435**
Profit tax (35%)		510,245.25	1,723,526.56	2,678,327.95	4,053,963.36	6,020,221.95	8,814,438.07	12,766,583.63	18,334,936.03	26,155,388.23	37,109,602.10
Net Profit	**(5,481,381)**	**947,598**	**3,200,835**	**4,974,038**	**7,528,789**	**11,180,412**	**16,369,671**	**23,709,370**	**34,050,595**	**48,574,292**	**68,917,832**
Net Present Value		**89,372,445**									
IRR		**78.6%**									

Table 4: Financial analysis summary for sheep breeding in Menz

Menz	0	1	2	3	4	5	6	7	8	9	10
Capital	100,000										
Income											
Market Sheep		4694655	6,478,624	8,940,501	12,337,891	17,026,290	23,496,280	32,424,867	44,746,316	61,749,916	85,214,885
Revenue		**4,694,655**	**6,478,624**	**8,940,501**	**12,337,891**	**17,026,290**	**23,496,280**	**32,424,867**	**44,746,316**	**61,749,916**	**85,214,885**
Expenses											
Feed costs		1,367,745	1,627,616	1,936,863	2,304,867	2,742,792	3,263,922	3,884,068	4,622,040	5,500,228	6,545,272
Veterinary costs		8,400	9,996	11,895	14,155	16,845	20,045	23,854	28,386	33,780	40,198
Other expenses		440,000	523,600	623,084	741,470	882,349	1,049,996	1,249,495	1,486,899	1,769,410	2,105,597
Purchasing cost of Sheep		1,350,000	-	-	-	-	-	-	-	-	-
Total Expenses		**3,166,145**	**2,161,212**	**2,571,842**	**3,060,492**	**3,641,986**	**4,333,963**	**5,157,416**	**6,137,326**	**7,303,417**	**8,691,067**
Gross Profit	**(3,266,145)**	**1,528,510**	**4,317,412**	**6,368,659**	**9,277,399**	**13,384,304**	**19,162,317**	**27,267,450**	**38,608,991**	**54,446,499**	**76,523,818**
Depreciation		2,500	2,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Profit Before Tax		**1,526,010**	**4,314,912**	**6,364,159**	**9,272,899**	**13,379,804**	**19,157,817**	**27,262,950**	**38,604,491**	**54,441,999**	**76,519,318**
Profit tax (35%)		534,103.63	1,510,219.13	2,227,455.51	3,245,514.62	4,682,931.42	6,705,235.93	9,542,032.65	13,511,571.74	19,054,699.65	26,781,761.27
Net Profit	**(3,266,145)**	**991,907**	**2,804,693**	**4,136,703**	**6,027,384**	**8,696,873**	**12,452,581**	**17,720,918**	**25,092,919**	**35,387,299**	**49,737,557**
Net Present Value		**67,809,831**									
IRR		**93.8%**									

Risks And Challenges

Starting a business in rural Ethiopia is genuinely an arduous task. When it is related to livestock it becomes more difficult. Empirical studies have shown that community-based small ruminant breeding programs are highly rewarding to rural farm households in different parts of Ethiopia. Studies have also shown the challenges faced by farm households in their effort to establish and run community-based breeding (Gizaw *et al.*, 2013; Gutu *et al.*, 2015; Haile *et al.*, 2019, 2020; Weldemariam and Mezgebe, 2021). We present below a summary of the key challenges that a small ruminant breeding business might face in rural Ethiopia.

- **Limited legal support to enforce group/community bylaws and code of conduct.** The justice system in rural Ethiopia is still at an infant stage. The proper functioning of the breeding business depends on the extent to which the agreements and business code of conduct are enacted. Experience so far shows that there is limited legal support for rural cooperatives and adjudications of charges by or for rural cooperatives take quite a long time. This could be a serious problem for this business as it needs to have an institutional management system that is backed by the judiciary system.
- **Feed shortage:** Feed shortage is the most important challenge livestock keepers are facing throughout the country. Sheep breeders will experience the same problem with worse consequences because of the size of the herd that the business has to manage. The limited supply of commercial feed in the country is not going to help either. This is a challenge the entrepreneurs must plan for unless they have enough land to produce feed and forage.
- **Diseases and pests:** Pests and diseases are the second most important constraint for small ruminant keepers in Ethiopia. Disease outbreaks and pests pose a significant challenge for sheep breeding businesses. These can lead to high mortality rates, decreased productivity, and increased costs for entrepreneurs. The problem is more of a lack of veterinary services to protect the animals from well-known diseases

and pests. The breeders need to establish a formal linkage with veterinary service providers while establishing their business. Without sufficient and timely investment in health management services, the breeding business cannot stay afloat.

- **Lack of market infrastructure:** rural areas in Ethiopia are characterized by limited road networks. The lack of roads has also limited the availability of transportation services. Hence, transportation of animals is usually done on foot where animals are often trekked for hours. The lack of roads limits the size of the market for the products of the business. Because of trekking, the animals end up thirsty and hungry because of a lack of water and feed along the way or in the markets. Once in the markets, scorching sun and rain showers could also harm the animals, reducing their market returns, as markets hardly have any sheds or covers for the sheep.
- **Unwillingness of farmers to keep all young rams/bucks until the time of selection:** This unwillingness may lead to limiting the gene pool and reducing genetic diversity within the sheep herd. It is important for the entrepreneurs to understand the long-term benefits of keeping young rams until the time of selection, reaches maturity and can be properly evaluated for their genetic potential hence, this must be part of the code of conduct of the business. Additionally, collaboration between the entrepreneurs can help in providing support and resources for managing and maintaining a diverse breeding program.
- **Conflict among business partners:** As much as the bylaws and the code of conduct might help in reducing and managing conflicts among the collaborating entrepreneurs, they cannot guarantee complete harmony. Any conflict that affects production and marketing at any level will have implications for the performance of the business. Especially in cases where there is no quick resolution of the conflicts, the business could bleed to bankruptcy quickly. The business needs to have dynamic management with a clear understanding of the legal environment to solve conflicts within the business.

Management Plan

Managing a small ruminant community-based breeding business requires a comprehensive management plan. The plan needs to have some key components. First, it is essential to have a team of skilled and knowledgeable staff who can oversee breeding operations and ensure the health and well-being of the animals. This team should also be responsible for maintaining accurate records, monitoring breeding performance, and implementing appropriate genetic selection strategies. Second, regular veterinary care and preventive measures should be implemented to prevent the spread of diseases and ensure the overall health of the herd. Lastly, a clear marketing strategy should be developed to promote the products and services of the business.

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