



Business Models for Selected Interventions for the Development of Small Ruminant Value Chains in Ethiopia

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Acronyms

BOKU	University of Natural Resources and Life Sciences
CBBP	Community Based Breeding Program
CGIAR	Consultative Group of International Agricultural Research
CRP	CGIAR Research Program
ICARDA	International Center for Agricultural Research in Dryland Areas
ILRI	International Livestock Research Institute



Executive Summary

- This document presents business models for three best-bet interventions identified, tested and recommended in selected sites of unique characteristics in the small ruminant value chains in Ethiopia.
- The document aims at availing initial ideas for interested business and researchers on the potential of the best bets as business interventions in the sites where they were tested for up to four years. There is no deliberate intention to prescribe the way the businesses shall be designed and implemented. The business models will however be useful starting points for anyone who intends to make a meaningful investment on any one or more of the best bets.
- Sheep and goat farming seems to be rewarding and interesting, but it is important to get enough information before investors delve into the business of fattening and selecting rams for breeding. This document presents in detail how profitable small ruminant fattening and ram selection will be in the intervention sites.
- The International Center for Agricultural Research in the Dry Areas (ICARDA), International Livestock Research Institute (ILRI) and Boku University of Austria came up with the idea of Community Based Breeding Programs (CBBP) in Ethiopia. It is a value chain development intervention that focuses on improving the indigenous breeds.
- Community-based breeding schemes (CBBS) combine selection of breeding rams/bucks based on careful recording of important production parameters, such as body weight at 6 months, ewe lambing interval, ram lamb bodyweight and conformation at 12 months, etc. (Haile et al., 2011). There are CBBS for certain breeds such as Menz and Bonga that select breeding males from farmers to serve as breeding rams for about two years. They are then castrated and fattened for sale. Similarly, the Amhara Livestock Resource Development Promotion Agency highlighted that male animals that are used for breeding are placed for fattening after two years of age.
- This business of small ruminant fattening and ram selection shall be located where customers can easily access its products. A direct channel of distribution needs to be used to ensure that the final consumers get the best value for their money. The business sells directly to local and regional wholesale and retail markets. The products will be sold to farmers, consumers, retailers, wholesalers, hotels, supermarkets, etc.
- Market information can play an important role in promoting agricultural development, especially for small-scale producers. Regular, timely and accurate livestock market information is an essential ingredient in creating a transparent livestock market that levels the playing field to allow all the actors in the market to make an informed decision and facilitate livestock marketing activities.
- Various government agencies and non-governmental organizations in the country collect price information, sometimes in the same market, in different formats and for different purposes mostly for their own sectoral use with little or no dissemination to the actors in the livestock value chain.
- The purpose of the market information provision business is to provide livestock market information for producers, traders, and customers using SMS and voice calls. The information to be provided will mainly include small ruminant trait preferences, price expectations, quantity demanded, quantity supplied, availability of and access to market services, and key social [e.g., extraordinary social occasions] and environmental [e.g., profound shifts in the



weather] phenomena.

- Our analysis shows that small ruminant fattening, community-based ram selection using locally available feed resources under rural smallholder conditions, and livestock market information provision are financially very rewarding.



Introduction

Small ruminants (sheep and goats) have a unique niche in smallholder agriculture, because they require relatively lower investments; have shorter production cycles, faster growth rates and greater environmental adaptability as compared to large ruminants. They are important protein sources in the diets of the poor and help to provide extra income and support survival for many farmers in the tropics and sub-tropics (FAO, 2002).

Ethiopia is believed to have the largest livestock population in Africa. The livestock sector has always been an important component of the agrarian economy of the country and seems to remain to be so in the near future. It is eminent that livestock products and by-products; i.e., meat, milk, honey, eggs, cheese, and butter supply etc., are important animal sourced foods that enormously contribute towards the improvement of the nutritional status of the people. Livestock also serve as a source of foreign earnings through live animals, meat, hides, and skins exports.

Small ruminant production is an important agricultural enterprise in Ethiopia. According to CSA, in 2016/17 the total sheep and goat population reported in the country was estimated to be about 30.70 million and 30.20 million, respectively. The sheep and goat population are almost entirely of indigenous breed where only 1% is of exotic or mixed blood (CSA, 2017).

Sheep fattening and breeding in rural, peri-urban and urban areas of Ethiopia is a common practice among smallholder farmers. The potential for fattening and breeding of animals in Ethiopia is high since the number of animals is large and the demand for small ruminant products is increasing both in domestic and international markets. Sheep and goat fattening by cooperatives and large-scale farms has emerged in recent years. This growing interest in sheep and goat fattening can be attributed to the ever-increasing demand for better quality meat, especially during the holidays. In addition, the demand for Ethiopian sheep and goat meat has dramatically increased after market promotion by development projects and governmental initiatives. This has created an opportunity for sheep and goat producers to sell more animals at better prices in domestic and international markets (Animut and Wamatu, 2014).

However, the traditional and extensive production systems in which small ruminants are kept fail to produce animals of the required quantity and quality (Solomon et al., 2011). In addition, lack of well-functioning marketing systems that effectively link the smallholder producers and their cooperatives with domestic and international markets affects the performance of the entire value chain. Ayele et al. (2003) reported that current knowledge on livestock market structure, performance and price is poor and inadequate for designing policies and institutions to overcome perceived problems in the marketing system.

This document presents business models for three best-bet interventions identified, tested and recommended in selected sites of unique characteristics in the country's small ruminant value chain. The intention of the document is to avail initial ideas for interested business and researchers on the potential of the best bets as business interventions in the sites where they were tested for up to four years. The document does not intend to prescribe the way the businesses shall be designed and implemented. The business models will however be useful starting points for anyone who intends to make a meaningful investment on any one or more of the best bets.

The project pre-feasibility summarized in this document might serve as a basis of an important investment decision. The document covers various aspects of project business models including price, production, marketing strategies, and financial analysis.

Small ruminant fattening and breeding business

Rationale for the business

Small ruminants are cheaper and easier to feed. Producers can manage them quite easily as they require very minimal supervision. Private investors can start small ruminant fattening and breeding business with very little capital compared to large livestock farming. Small ruminant fattening is strongly recommended as a profitable venture by fatteners, National Agricultural Research Centers, Bureaus of Agriculture and Livestock Resource Development Promotion Agencies (Animut and Wamatu, 2014). For example, Bonga sheep is one of the breeds known for high growth rate or high weight gain and high meat quality even under poor management – for example, poor feeding (grazing on natural pasture) (Edea et al., 2012).

In addition, small ruminants are in high demand and have other uses apart from being sources of meat, milk and milk products. Sheep and goat skin is a very good source of leather which can be used to make bags, shoes and other leather products. Small ruminant droppings are also very good quality manure for people interested in applying organic and accessible fertilizer. Goat and sheep offal is also used in the pharmaceutical industry.

Sheep and goat farming seems to be rewarding and interesting, but it is important to get enough information before investors delve into the business of fattening and selecting rams for breeding. This document presents in detail how profitable small ruminant fattening and ram selection will be in the intervention sites.

Target Markets

The private investor will target both domestic and international market establishments interested in differentiating themselves from their competitions through higher quality products for a reasonable price. The business owners will also ensure that they position their business to attract consumers of agriculture produce not just in the selected Woredas alone but also other parts of the country. The producer will target individual consumers, hotels, supermarkets, retailers, wholesalers and exporters where locally produced specialty products have been growing in popularity.

Description of the business models

A number of potential business models could be suggested for small ruminant farm businesses aiming at adding value to their product and/or invest along the value chain. The potential investments along the small ruminant value chains include creating a high-quality product following demand-driven production, partnering with other investors, creating an environment for the development of niche marketing companies to operate, franchising breeding lines and developing dedicated supply chains aligned with the customer/retailer/end market (DAFWA, 2017). Value can be added to fresh meat, milk and milk products through cleaning, packaging, processing, cooling, smoking, drying or any other form of processing that differentiates the product from the original raw commodity.

Production Strategy

The fattening and ram selection business aims at producing well performing marketable products from small ruminants to maximize profit and make the business sustainable. To achieve this objective, consideration of production and other costs that determine profitability is necessary. Sheep and goats in Doyogena and Bonga are relatively larger and have acceptable conformation for meat production which can be supplied to both domestic and export markets. Therefore, sheep and goats of Menz, Doyogena and Bonga types can be supplied for the project at a relatively lower cost for fattening and breeding purposes.

Feed is a serious limiting factor of the livestock production sector in Ethiopia with the result that many animals arrive at the market in less than optimal body condition (Demissie, 2017). Small ruminants obtain at least half of the energy requirement from grazing, which is very low cost feed source and suited for local sheep and goats. The profit from small ruminant production is attained by minimizing feed costs which account for more than half of the total cost of production. For this analysis, we are assuming that the producers use open range grazing and give supplementary feed. Similarly, storage and conservation of forage, use of high protein fodders, treatment of crop residues, and mineral nutrients will improve overall forage quality and give better results. With rations formulated to achieve average daily gain (ADG) of at least 100 g/day, rams in Bonga and Doyogena achieved ADG averages of 95-107g/day. Menz breed's performance was poor (15-51 g/day) (ICARDA, 2017).

Community-based breeding schemes (CBBS) combine selection of breeding rams/bucks based on careful recording of important production parameters, such as body weight at 6 months, ewe lambing interval, ram lamb bodyweight and conformation at 12 months, etc. (Haile et al., 2011). There are CBBS for certain breeds such as Menz and Bonga that select breeding males from farmers to serve as breeding rams for about two years. They are then castrated and fattened for sale. Similarly, the Amhara Livestock Resource Development Promotion Agency highlighted that male animals that are used for breeding are placed for fattening after two years of age (ICARDA, 2014).


Products and Service

A business on small ruminant fattening and ram selection offers a range of benefits depending on the herd composition and breed types. The outputs from such businesses can be grouped into improved breeding, fattened animals (meat), milk products, and by-products such as manure, skin, and offal. Immediate products include meat and milk and their processed products. Economic and environmental benefits are derived from dung (which improves soil fertility and structure) and from nutrient recycling. Such a business can also have training services for smallholder farmers, cooperatives and others private investors who are planning to enter sheep and goat businesses.

Factors of Production

To make small ruminant fattening and breeding business practical, it is required to know the vital resources in selected Woredas. The main resources include selected breeds, capital, feed, land and labor.

Breed Selection: In all selected Woredas, the dominant sheep and goat being kept are local breeds. The local breeds are of different types. The breeding stock in all selected Woredas comes from farmers' own herds, traders and other farmers in the local market. The International Center for Agricultural Research in the Dry Areas (ICARDA), International Livestock Research Institute (ILRI) and



Boku University of Austria came up with the idea of Community Based Breeding Programs (CBBP) in Ethiopia. It is a value chain development intervention that focuses on improving the indigenous breeds. Currently appreciable genetic improvement has been achieved in Menz, Bonga and Doyogena areas (ICARDA, 2011). The producers should not only select breeds that are suitable for fattening, but also select the most suitable ones among the selected animals. This is quite useful because, through improved management, the weight gain of these selected animals could be considerably improved.

Capital: the producer will need sufficient soft and hard capital to pay back initial investment and run the business in a viable way. Rural microfinance institutions, household asset-building programs and rural savings, credit associations, etc. are the major sources of credit for sheep and goat producers in Menz and Doyogena (Legese et al., 2014).

Feed: The agro-ecological conditions of the different parts of the country determine the type of crop and animal production. The source of animal feed in Bonga, Doyogena and Menz relies heavily on natural pasture, crop residues and agro-industrial by products. Our analysis shows that small ruminant fattening using locally available feed resources under rural smallholder conditions is profitable.

- For example, in **Doyogena**, which is a highland, major feeds commonly used for sheep and goats include natural grazing, fresh cut local grass (during wet seasons), browse (like tree lucerne, sesbania and other local herbs and shrubs), false banana roots (locally known as *hamicho*), potato tubers and leaves (during seasons of potato production), household food scraps and residues (like coffee and *enset* residue), wheat bran, noug cake (very rarely), oat fodder and local brewery by-products.
- In **Bonga**, on the other hand, the main supplementary feeds were grains (boiled bean, pea and maize), crop residues, human food left overs, like *Atella* of Tella, Areke and Borde, which are the by-products of locally made beverages. However, agro-industrial by-products such as wheat bran were the only supplements fed to breeding animals during the dry season in mixed crop-livestock systems (Kassa et al., 2014)
- Crop residue is the major source of livestock feed in Menz. Sheep and goats in this area depend on natural pasture.

Land: Availability of investment land varies with agro-ecological zones and it is relatively easier to get land in the lowlands where there is lower population pressure. Population pressure in the highlands makes it difficult to get large plots of land for livestock breeding activities. The government created an Agricultural Investment Support Directorate (AISD) under the MoA to facilitate acquisition of large tracks of land (greater than 3000 ha) for foreign and local investors. The MoA has the responsibility of providing technical support for private investments in agriculture. The support includes, among other things, providing areas, information, technical support and facilitation of relationships with other public services (ICARDA and ILRI, 2014).

Labour: Labour demand for small ruminant fattening and breeding depends on the number of sheep and goats maintained for fattening and the objective of production. Most smallholder rural and small-scale peri-urban and urban fatteners keep very few sheep and goats for fattening and breeding in a given cycle. Labour is therefore not a big concern and the work is handled by family members in Bonga, Doyogena and Menz smallholder farmers. Labour is not also a concern in cooperative fattening and breeding system as members of the cooperative are directly involved in various activities.



Technology

Availability of improved technologies are critical to transform the traditional subsistent production systems into market-oriented profitable enterprises. Improved livestock technologies have been generated and/or adopted from elsewhere. However, because of inefficient delivery of these services, improved technologies remained unavailable or inaccessible to the producers (Solomon et al., 2010).

In this business, higher quality indigenous breeds of sheep and goats will be used for both fattening and ram selection activities. Furthermore, best management practices and veterinary services need to be in place to supply superior quality products and services to customers. In general, up-to-date technologies and research results are expected to be employed in this business.

Transport

Transport could be a key factor in the success of realizing the potential of sheep and goat-based businesses. Traditionally, supply of live animals from smallholder producers to the various categories of markets (primary, secondary and terminal markets) in the country is mainly carried out either by trekking or trucking or a combination of both. Trekking is the predominant means of transporting animals from farm gate to the next village or primary markets. Most of the animals sold at the secondary markets are transported to the terminal markets and slaughterhouses by truck (Legese et al., 2014).

This also relates to transporting the inputs required for processing livestock products as well as transporting the final products to a distant market or outlet. Existing local transport arrangements may be adequate or adaptable to the marketing needs of small farmers. However, there could be special needs for perishable food products including refrigerated containers for meat or milk for a profit-oriented intervention. Investment in such facilities is critical to the success of the marketing operation.

Veterinary services

Most of the farmers and pastoralists use prescription drugs to treat sick animals. However, there is a concern about the use of drugs from informal sources where adulterated drugs are being supplied resulting in improper use of medicines. Yet, legal veterinary services are not available to 91.2% of farmers in Bonga (Gizaw et al, 2013). Instead, they have to travel 25 km to the nearest veterinary clinic. Similarly, in Doyogena the government is virtually the only source of veterinary services and the coverage is very limited. Farmers are facing challenges in treating their animals due to shortage of veterinary drug supplies. Therefore, fattening and breeding programs need to consider the delivery of proper and cost-effective disease control strategies, training of livestock keepers, and strengthening of veterinary services. Community-based, animal health worker programs could be an option (ICARDA, 2013). It is also recommended that the animals need to be properly vaccinated before joining in the farm. In addition to vaccination, the animals must be dewormed regularly (quarterly in a year). For external worms, the animals also need to be sprayed or dipped with some proper insecticide for protection.

Marketing and sales strategy

In Ethiopia, the demand for sheep and goats generally increases prior to various religious and cultural festivals. It is customary for households to slaughter small ruminants during these festivals. Taking religious holidays as a case in point, there is a high demand for sheep and goats at the end of August to celebrate Ethiopian New Year, in December for Christmas and in April for Easter. There is also high demand during the Ramadan and Arafa festivities.

In fact, with the ever-increasing prices of livestock products, a growing number of households are unable to afford well-conditioned animals. To increase market prices, therefore, private investors are encouraged to market their live animals directly to processors and the final consumers, network with other producers and participate in marketing cooperatives.

In all intervention sites where these innovations were tested, farmers sell sheep and goats at their farms and/or the village and primary markets close to their residences. Farmers and rural assemblers from different local markets supply animals of varying sex, age and weight to secondary markets. There are two major market routes through which animals from the sites reach to the tertiary markets. The first route is through agents of export abattoirs who collect young male sheep and goats from the local markets. The second and most important route is through medium and large traders who collect animals from Bonga, Doyogena and Menz areas and supply through large traders to terminal domestic markets in Addis Ababa.

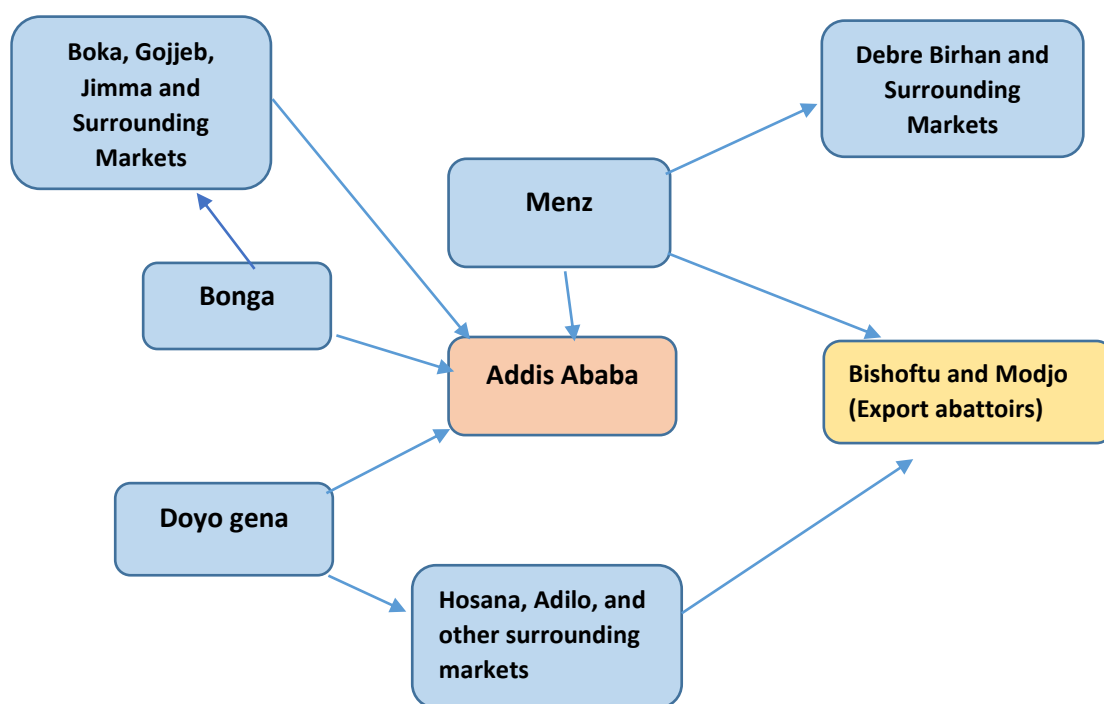


Figure 1. Marketing route for sheep and goats produced in Menz and Doyogena.

Source: Legese et al., 2014; Kassa et al., 2014.

Marketing services have many overlapping components including assembling small ruminants from local farmers, transporting to potential markets and distributing them to customers. In the current market structure, animal traders collect animals from the rural areas and sell them in animal

markets in the urban areas. Butchers purchase these animals from animal markets and slaughter them in the slaughterhouses. Butchers act as meat traders and dominate the meat market both in rural and urban areas. There is a serious shortage of slaughter animals for meat supply mainly for export market. This shortage is being observed through meat-less days (Tekeba et al., 2018).

Successful marketing of the products of such a business requires consistency, careful organization and cost-effectiveness. The businesses, however, need to be supported in many ways. Assistance may take the form of market information on market opportunities, prices and quality requirements, transaction mechanisms between producers and buyers, product advertising, the role of middlemen, and the creation of local markets (Getachew et al., 2008). Many actors are involved in small ruminant marketing. The actors can be broadly classified as producers, traders, butchers, retailers, consumer and exporters. Private and public livestock inputs and service providers are also other important market actors (Figure 2).

Livestock markets are generally under the control of local authorities. Livestock market locations in primary and secondary markets are typically not fenced; there are no permanent animal routes and no feed and watering facilities. Yet buyers and sellers are subjected to various service charges by the local authorities.

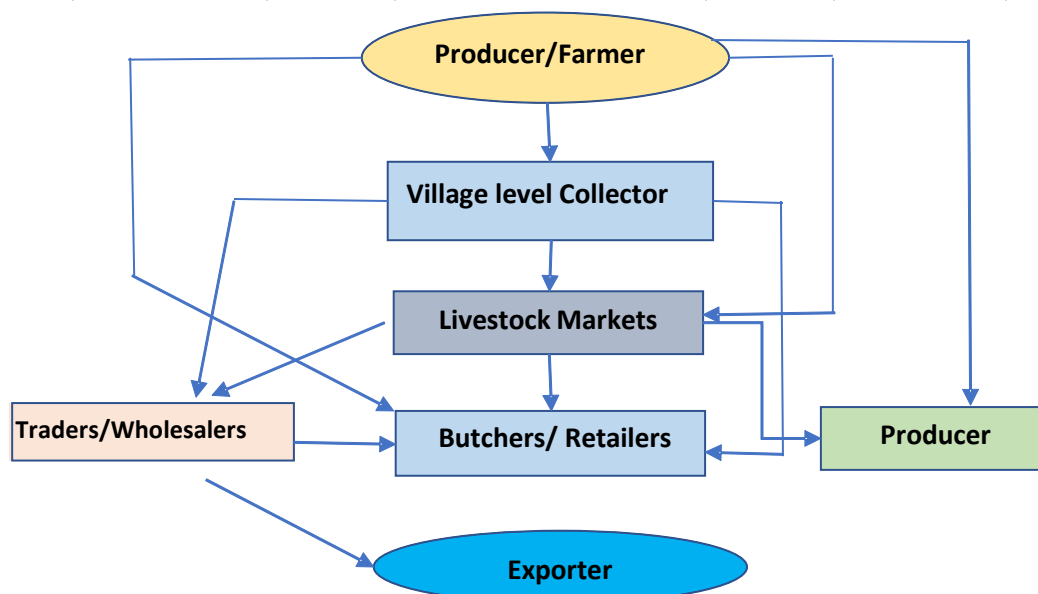


Figure 2: Marketing of Live Animal Small Ruminants

Distribution Channel

This business of small ruminant fattening and ram selection shall be located where customers can easily access its products. A direct channel of distribution needs to be used to ensure that the final consumers get the best value for their money. The business sells directly to local and regional wholesale and retail markets. The products will be sold to farmers, consumers, retailers, wholesalers, hotels, supermarkets, etc.

Six major marketing channels were identified in the intervention sites:

- Channel 1: Sheep and goat purchased by other farmers for breeding purposes.
- Channel 2: Sheep and goat purchased by individual consumers

- Channel 3: Sheep and goat purchased by small traders
- Channel 4: Sheep and goat purchased by big traders
- Channel 5: Sheep and goat slaughtered at hotels and butcheries
- Channel 6: Sheep and goat purchased by other cooperatives for breeding.

Pricing Strategy

Demand for sheep and goats varies depending on the season and the location. It is high during times of religious and cultural holidays. Because of higher demand for sheep and goats in January, February, April, September and December, farmers sell their animals at relatively higher prices. Domestic market demand could emanate from individual consumers, hotels, butchers and farmers. Despite an increase in meat production, the prices have moved upward due to the disproportionate increase in demand. The demand increment happened due to increase in export of live animals and meat to the Middle East and African countries. In addition, there has been hike in meat price particularly due to illegal smuggling of animals to neighboring countries.

In this business model, we have adjusted the price of small ruminants supplied to the consumers based on types of animal and market research. A business will price its products in line with ruling market prices. The figure below depicts that the business will adopt a competitive pricing approach as it will be important to adopt a comprehensive costing model to know the actual cost of production per sheep/goat. This will keep the business from pricing its products much lower than the cost of production (Andreas, 2008).

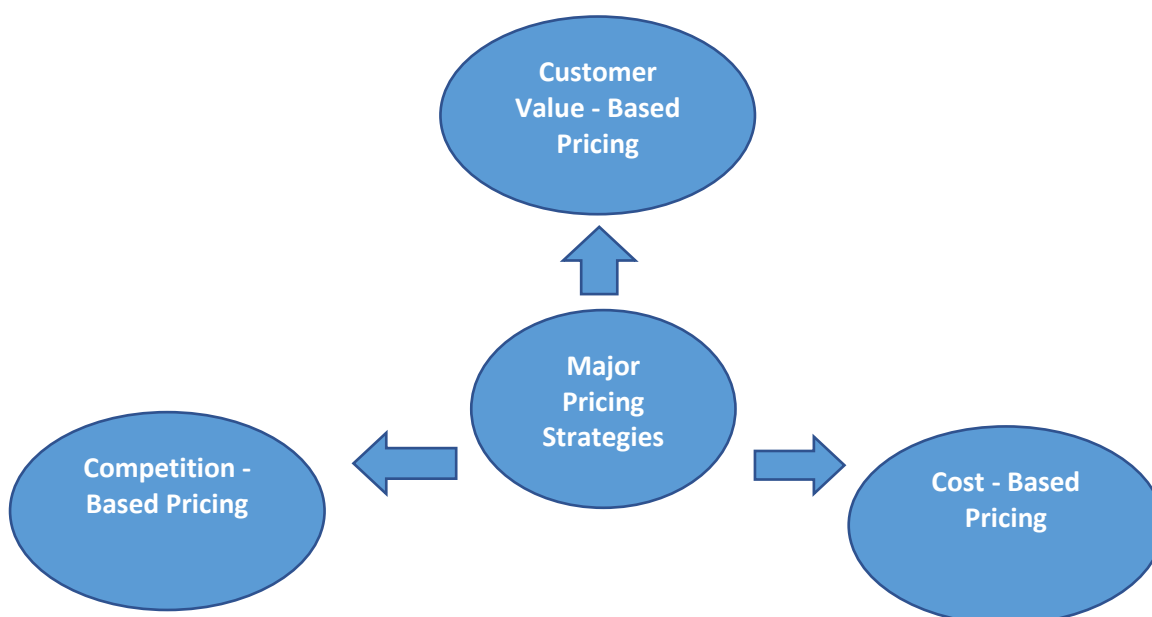



Figure 3: Three major Pricing Strategies

Competitiveness on the market and competitors

Marketing of the products of this business will face serious competition from local farmers, private farms engaged in similar activities in Doyogena, Bonga and Menz and other neighboring Woredas. The major difference between products supplied by such a business and those supplied by competitors is that the products of the business will be well managed, free of diseases and of the



quality demanded by customers. The business is expected to sell live small ruminants and their products at competitive prices, good networking and carefully managed clients. Another competitive advantage such a business will bring to the industry will be involving in high standard packaging and processing of meat, milk and milk products.

Promotion Strategy

It is important to create strategies that will help businesses create a corporate identity for their commercial small ruminant fattening and ram selection. Below are the platforms private investors might need to leverage on to boost and advertise their business:

- Posters, press releases in local newspapers and magazines
- Short message service (SMS) to cellphone users using, for example, a hotline
- Tele marketing (promoting through direct call to selected customers)
- Participate in agriculture exhibitions
- Actively work on mass and social media outlets
- Installing bill boards on strategic locations
- Websites and other web based adverts
- Promotional discounts and gifts.
- Promotional flyers and creation of well-designed business cards.


Business environment and risk analysis

Domestic markets serve individual consumers, hotels, butchers and institutional consumers (such as hospitals, universities and the army). These consumers need animals of different qualities and parameters vary with agro-ecology, season, wealth category and type of institution. Individual consumer preferences, for example, vary with location. Highland consumers usually consume mutton while low landers prefer goat meat. The type of animals demanded by individual consumers varies with the wealth of the consumer. Well-off households usually go for castrated, fattened sheep or goats, while others go for male yearlings (Legese and Fadiga, 2014).

The ability to respond to market demands is a crucial factor in being able to make the most of new and expanding market outlets. Therefore, potential investors must provide what is required by consumers. Otherwise, prices are likely to be low or goods will remain unsold. Consumer demand for livestock products is expected to be affected by the quality and stability of supply at reasonable price levels.

Revenue Maximization Strategy

Profit margins in agricultural enterprises tend to be small. However, it is possible to make a profitable sheep and goat fattening and ram selection if costs are controlled and returns carefully managed. The profitability of this fattening and breeding business depends principally on the cost of the initial herd, feed cost, feed conversion efficiency ratio, and selling price of the products. Private investors can manage feed costs by maximizing the use of natural pasture when available, producing their own harvested feeds, mixing their own rations, buying and storing feed in bulk, and minimizing feed wastage. It is important that the investors understand the conversion ratios and profit margins before starting this business.



Revenue is important because it is the main indicator of a business' performance. Producers should take different approaches to maximize revenue, such as using various marketing strategies as translated through their business models. They can seek to grow revenue by offering competitive prices in the market. There is also the option of offering higher quality products and services at current market prices to differentiate themselves from the competition. In addition, there are key strategies for maximizing revenues including:

- Increase the quality and quantity of sales
- Review pricing strategies
- Expand distribution channels
- Diversify their offerings (replace old products with new ones)
- Develop networks and client bases
- Increase the average transaction size
- Increasing the number of customers etc.

Partnership

Commitment and communication across various actors along the value chain are required to build trust and add more value onto the products. The company will need to have a **well-established partnership** with one or more meat associations, **agricultural research institutions, and bureaus of agriculture at district level**. It will also have a business relationship with a regional distribution company to deliver these products to customers throughout the region. It will be better to create linkages between producers and cooperatives, exporters and special consumption centers, including military camps, universities etc.

Risk Analysis


Numerous constraints limit the productivity of sheep and goat in Ethiopia. In ICARDA's intervention sites, the local sheep and goat productivity is constrained by feed shortage, diseases, poor infrastructure, lack of market information, limited technical capacity and lack of planned breeding programs (Solomon et al., 2010). The intensity of these challenges differs from location to location and from business to business. The major risks associated with small ruminant business are briefly discussed below.

Feed Shortage: Feed shortage may happen due to drought, overgrazing, ecological deterioration, etc. The traditional sheep and goat fattening takes 6 months or longer. Farmers attribute the long fattening period to lack of adequate and quality feed, and poor management due to limited skills and knowledge of improved fattening practices (ICARDA, 2017).

The major source of feed in Bonga and Menz areas is natural pastureland. Almost all farmers and pastoralists reported that they faced feed shortages during the dry seasons. In Menz, the strategies for coping with feed shortages included provision of on-farm produced supplementary feeds, purchased feeds, irrigation of private grazing land, and reduction of flock sizes. Most of the farmers in Bonga (97%) provide supplementary feed for their sheep during the dry season.

New strategies to improve feed resources include improving the use of available crop residues, hay making, and forage development by allotting part of the cropping lands for these purposes or during periods when the croplands remain idle (Gizaw et al., 2013).

However, the quantity and the quality of the available feed resources can be improved through, among others, biodiversity conservation, pasture rehabilitation, integration of pasture and forage in



to farming system, irrigation and better grazing land management.

Diseases: Diseases are another major factor affecting productivity of sheep and goat in the intervention sites. Whenever an epidemic occurs, it not only brings substantial physical loss on animals but also a simultaneous loss of demand for the products because of consumer reactions. To minimize risks associated with disease, there is a need to enhance the service delivery system and ensure availability of enough health services.

Market problems for inputs and outputs: Key inputs for small ruminant businesses are labor, land, capital, feed, feed processing units, and veterinary services. Market needs to be available for the inputs and for the outputs of the business, i.e., breeding ram, fattened live animals, and milk. If there is time lag between demand for and supply of importable inputs, the higher the risk for the business. This makes investment decisions more difficult.

Change of weather condition: In addition, during the dry season or if drought occurs, the businesses discussed here could face feed shortages which can affect the project viability.

Political unrest: Instability of any kind may also disturb and have a negative effect on the implementation of this project. It may prevent the project from supplying products on time and at the required quality both for local and for international markets.

Financial Analysis

A detailed financial model has been developed to analyze the commercial viability of small ruminant fattening and breeding farms. Various cost and revenue related assumptions along with results of the analysis are outlined in this section. This analysis shows whether investing in a sheep and goat fattening and ram selection will be financially rewarding.

Materials and methods used for analysis

- Two alternative production systems of fattening and breeding are considered in the project for both goat and sheep.
- Revenue estimates are derived mainly from sale of kids, ewe/does and culled ewes/doe and buck/ram. In addition the revenue estimate include the sale of meat production. The business will provide training services for smallholder farmers, cooperatives and others private investors who are planning to enter sheep and goat businesses.
- Project worth analysis is done using the current interest rate; i.e., 9.25%.
- These procedures are used in analyzing the breeding business and the same can be applied for preparation of a financial analysis pertaining to the fattening business.

Key Assumptions:

- The project will start with a 500 sheep in one production cycle. Over the years the size of the farm will increase regularly.
- Human Resource Requirement (Supervisor (1), Accountant (1), Daily Laborer (2) and Cleaner and Feeder (1)
- Mortality Rate = 8%
- Percent lambs born live = 150%
- Ewe replacement rate = 15%
- Ram replacement rate = 5%

- Sheep price will increase by 8% per year
- The cost of other expenses (e.g., feed, veterinary cost, labor cost, utilities etc.) will increase by 2% per year.

Financing Assumptions:

- Interest rate = 9.25%
- Income tax = 35%

Depreciation Rates

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

Limitations in preparation of the budget:

Budgets are generally constructed to reflect future actions and it is difficult to accurately predict future prices and yields.

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 for the three intervention sites in Table 1.

Table 1: Total initial investment cost (in Birr)

Costs	Common costs	Sheep			Goats		
		Bonga	Doyogena	Menz	Bonga	Doyogena	Menz
Purchasing cost of livestock		350,000	365,000	275,000	275,000	300,000	225,000
Housing (Renovating of existing building structure)	50,000						
Office Furniture and Equipment	10,000						
Handling system	7,000						
Feeders (hay, grain, mineral)	5,000						
Feed storage	10,000						
Total initial costs	82,000	432,000	447,000	357,000	357,000	382,000	307,000

Other costs

The total project outlay was estimated to be 648,000, 620,280, 569,880 Birr per annum in Bonga, Doyogena and Menz for fattening, respectively (Table 2 and 3). For breeding, it was estimated to be 558,720, 542,088, 511,848 birr per annum in Bonga, Doyogena and Menz, respectively for initial operational requirements including feed costs, vaccination costs, electricity costs, utilities, transport, and salaries. Feed accounts for a sizable portion of the expense of raising sheep and goat - about 60 percent of the total (Table 2). There are different ways to feed sheep and goats, and hence feed costs can vary considerably among producers.

Table 2: Annual Feed Cost by Woredas (in Birr)

	Feeding Cost	
	Fattening	Breeding
Bonga	403,200	241,920
Doyogena	375,480	225,288
Menz	325,080	195,048

Table 3: Annual total costs (in Birr)

	Fattening	Breeding
Veterinary costs	60,000	84,000
Labor		
Supervisor	24,000	24,000
Accountant	18,000	18,000
Daily Labor	28,800	28,800
Cleaner	7,200	7,200
Utility		
Water	7,200	7,200
Electricity	6,000	6,000
Telephone	3,600	3,600
Transport	48,000	72,000
Marketing cost	18,000	24,000
Miscellaneous	24,000	42,000
Total Annual Expense	244,800	316,800

Financial Evaluation

According to the projected income statement, the businesses will start generating profit in the second year (see Tables A1-A6 in the Appendix). Important ratios such as profit to total sales and net profit plus interest on total investment (return on total investment) show an increasing trend over the lifetime of the project. The income statement and the other indicators of profitability show that the project is viable.

Assuming the costs of inputs and the market price of output will rise proportionately through the project life, the project feasibility analysis is performed using a discount rate of 9.25 percent to analyze the net present value of goat and sheep fattening project.

Using the NPV criterion for an investment with an objective of profit generation, a NPV greater than zero is acceptable. Since NPV in our study is positive, the investments are financially feasible. In addition, the value of IRR is greater than the value of the current cost of capital (bank interest rate). Therefore, we encourage private and public actors to invest in these interventions as they are financially rewarding and would also help the rural communities who are eking out a living from very limited resources.



Market information provision

Market information can play an important role in promoting agricultural development, especially for small-scale producers. Regular, timely and accurate livestock market information is an essential ingredient in creating a transparent livestock market that levels the playing field to allow all the actors in the market to make an informed decision and facilitate livestock marketing activities. Livestock market information system is a mechanism through which collection, analysis and dissemination of data and information needed to help producers, intermediaries, traders and customer are structured and schematized. This system could be designed in such a way that it provides near real time market information available on request via SMS text message system, voice call, email, and/or web-based access.

Livestock marketing information is crucial in Ethiopia, as in other countries, to improve decision making at all levels in the livestock industry – including competitiveness both in domestic and in international markets. Recent years have seen an increased interest in the provision of market information in Ethiopia. Various government agencies and non-governmental organizations in the country collect price information, sometimes in the same market, in different formats and for different purposes mostly for their own sectoral use with little or no dissemination to the actors in the livestock value chain.

The International Center for Agricultural Research in the Dry Areas (ICARDA) has developed and tested a unique livestock market information framework for over two years. Farmers have shown high level of interest in the information they were receiving and indicated willingness to pay for the information service which was provided free of charge as part of piloting. This business plan therefore builds on the empirical evidence accumulated over the testing period of the framework.

Objective of the business

The purpose of this business is to provide livestock market information for producers, traders, and customers using SMS and voice call. The information to be provided will mainly include small ruminant trait preferences, price expectations, quantity demanded, quantity supplied, availability of and access to market services, and key social [e.g., extraordinary social occasions] and environmental [e.g., profound shifts in the weather] phenomena. The services will aim at increasing the market participation and performance of all actors along the livestock value chain while making profit for the business. The business will also focus on maximizing profit while maintaining high quality service. In the end, the business will also be able to use the contact details of the target consumers of the services for other commercial purposes.

Target Market

This business targets all small ruminant producers, traders, intermediaries, processors, and consumers. The nature of the service allows easy scaling up given the increasing demand and hence the target market is expected to grow over time. Service marketing through SMS and voice call is a powerful tool that nearly everyone who has access to mobile phones can be part of. The business needs to aspire to reach as many people as possible with tailor made text and voice call-based services for the different groups of potential clients in the small ruminant value chain.



Description of the project

This business can be launched with the provision of the following two services:

Short message service (sms): SMS is an essential part of every mobile phone-based business and its marketing strategy. The short messages need to be developed based on real time contextualized data and information on the key aspects of small ruminant marketing. The service will primarily use permission-based text message delivery as a means to spread business products and promotional materials.

Voice call service: Potential customers might also be interested in calling services where they receive information calling in to a source. Given the growing culture of inquiring about different topics calling into different information outlets, this is as a very viable option. Therefore, with appropriate adjustment and careful structuring of the vocal messages provided, this option can be as effective as the short messages in delivering high quality service.

Marketing and sales strategy

Mobile phone use has increased in Ethiopia with subscription estimated to have reached 45 million where all subscribers are SMS users (Ethio Telecom, 2016)².

Pricing Strategy

The current market prices for SMS and voice call services will be used at the initial stage of the business. Ethio-Telecom, the only company that provides telecommunication services in Ethiopia – currently charges 1.00 Birr¹ per short message (160 Character for English and 70 characters for Amharic) for SMS and 3.00 Birr per minute for voice calls. The pricing strategy would be reviewed quarterly.

Product and Services

This business will provide the following information in both vocal and SMS communications:

- Consumers preferences for traits of small ruminants,
- price expectations,
- quantity demanded,
- quantity supplied,
- availability of and access to market services, and
- key social [e.g., extraordinary social occasions], economic [e.g, tax, exchange rates, tariff] and environmental [e.g., profound shifts in the weather] phenomena.

Advertising

For a startup business, the best form of advertisement would be word of mouth. Once, the business is well established video and audio adverts on mass media and through websites would be more effective. Advertisements on radio and television stations will also be an important option as

¹ 1.00 Ethiopian Birr is equivalent to 0.036 USD.

² Ethio telecom, 2016. Annual customer based report

majority of the value chain actors do have access. Newsletters, magazines, business card, flyers, and similar others need also be used to promote the products and services of the business.

Financial Analysis

The nature of this business allows interested investors the flexibility to use just small amount of capital to startup. The revenue from having an SMS short code would be determined by the number of messages received and the rates the business charges its customers.

Assumption

- The customer base will be 1% of the total mobile user; i.e., 450,000 in the first two years
- Demand for this short code business will increase by 10% every two years
- The cost of other expenses will increase by 5% every two years
- Discount rate = 10.00%

Revenue

The source of revenue will be the service charge for the information acquired through SMS or phone calls. For SMS fee is 1 birr per short message (160 Character for English and 70 characters for Amharic) and 3 birr per minute for voice call. Because of the current structure of the telecommunication market, this business can only be done in collaboration with Ethio-Telecom and hence the revenue will be shared 40/60 between Ethio-telecom and the business. The business is, therefore, to have a profit margin of 0.60 birr per page from SMS and 1.8 birr per minute from voice calls.

Cost

The total initial investment cost outlay has been estimated at 99,635.00 birr for initial year operational requirements.

Table 4: Total initial investment cost (in Birr)

Item Description	Total cost
Server	30,000
Inverter with battery	6,500
Access point	2,500
Furniture	10,000
Printer	6,000
Laptop (1 pc) and desktop computer (3 pc)	24,000
VPN and ADSL Line	10,000
Short code	10,355
Fixed lines	280
Total initial investment cost	99,635

The total monthly expense outlay has been estimated at 15,349 birr per month including office,

labor, installation fee, fixed line rent and miscellaneous cost.

Table 5: Other Expense Cost (in Birr)

Item Description	Monthly Cost
Office	5,000
Labour (3)	4,500
Short code rent	4,830
Fixed line rent	19
Miscellaneous	1,000
Total Monthly cost	15,349

Financial Evaluation

The project will start generating profit starting from the second year of initiation or first year into business. Return on total investment increases in an increasing rate over the lifetime of the project. The income statement and the other indicators of profitability show that the project is viable.

The net present value (NPV) is the value of all future cash flows (positive and negative) over the entire life of an investment discounted to the present. Positive NPV indicates financial viability of the business or project. Our analysis shows that the investment on market information provision as a business will be financially viable (see Table A7 in the Appendix). Similarly, the IRR of the investment is much higher than the current cost of capital (which is close to 10%). Therefore, this analysis ensures that this business will be rewarding financially. In addition to the direct benefit to business owners, this business will also have a positive impact on the rural community's market participation and performance.

Reference

- Abegaz S., Girma Abebe and Kassahun Awgichew. 2011. Sheep and Goat Production Systems in Ethiopia. Addis Ababa, Ethiopia: Ethiopia Sheep and Goat Productivity Improvement Program (ESGPIP).
- Animut, G. and J. Wamatu. 2014. Prospects to improve the productivity of sheep fattening in Ethiopia: Status, challenges and opportunities. Addis Ababa: ICARDA.
- Ayele Solomon, Assegid Workalemahu, Belachew Hurrissa, M. A. Jabbar and M. M. Ahmed, 2003. Livestock marketing in Ethiopia: A review of structure, performance and development initiatives. Socioeconomics and Policy Research Working Paper 52. ILRI (International Livestock Research Institute), Nairobi, Kenya. 35pp.
- CSA (Central Statistic Authority), 2017. Summary and statistical report of the 2016/2017 survey on Livestock and livestock characteristics, Addis Ababa, Ethiopia.
- DAFWA (Department of Agriculture and Food, Western Australia's), 2017. Concepts for alternative investment and financing models to expand sheep production in Western Australia (WA).
- Demissie Negash, 2017. Review on Compound Animal Feed Processing in Ethiopia: Condition, Challenges and Opportunities. Journal of Nutrition and Health.
- Edea, Z., Haile, A., Tibbo, M., Sharma, A. K., Sölkner, J. and Wurzinger, M. 2012. Sheep production systems and breeding practices of smallholders in western and south-western Ethiopia Addis Ababa: ICARDA and ILRI.
- Eshetie T., Kelifa Hussien, Tadesse Teshome, Abebaw Mekonnen. Meat production, consumption and marketing tradeoffs and potentials in Ethiopia and its effect on GDP growth: a review. Journal of Nutritional Health & Food Engineering. Ethiopia Meat and Dairy Industry Development Institute (EMDIDI), Ethiopia.
- FAO. 2002. FAOSTAT data (<http://faostat.fao.org/faostat/collections?subset=agriculture>, accessed on 25-Jun-2003).
- Gizaw S., Azage Tegegne, Berhanu Gebremedhin and Dirk Hoekstra. 2010. Sheep and goat production and marketing systems in Ethiopia: Characteristics and strategies for improvement. IPMS (Improving Productivity and Market Success) of Ethiopian Farmers Project Working Paper 23. ILRI (International Livestock Research Institute), Nairobi, Kenya. 58 pp.
- Gizaw S., Getachew, T., Edea, Z., Mirkena, T., Duguma, G., Tibbo, M., Rischkowsky, B., Mwai, O., Dessie, T., Wurzinger, M., Solkner, J. and Haile, A., 2013. Characterization of indigenous breeding strategies of the sheep farming communities of Ethiopia: A basis for designing community-based breeding programs. ICARDA working paper, Aleppo, Syria. 47pp.
- Haile, A., Wurzinger, M., Mueller, J., Mirkena, T., Duguma, G., Mwai, O., Solkner, J., Rischkowsky, B. 2011. Guidelines for Setting up Community-Based Sheep Breeding Programs in Ethiopia. ICARDA tools and guidelines No.1, ICARDA, Aleppo, Syria.
- Hinterhuber A. 2008. Customer value-based pricing strategies: Why companies resist. Journal of Business Strategy.
- ICARDA, 2011. Guidelines for Setting up Community-based Sheep Breeding Programs in Ethiopia.
- ICARDA, 2013. Characterization of indigenous breeding strategies of the sheep farming communities of Ethiopia.
- ICARDA, 2014. Prospects to improve the productivity of sheep fattening in Ethiopia: Status, challenges and opportunities.
- ICARDA, 2017. Enhanced Sheep Fattening with Modified Feeding and Management Practice.



- Kassa Tarekegn, Zelalem Abate and Hailemariam Gizaw , 2014. Analysis of Sheep Value Chain in KafaZone, Southern Ethiopia Southern Agricultural Research Institute; Bonga Agricultural Research Center, Bonga – Ethiopia.
- Legese G., and Fadiga, M. 2014. Small ruminant value chain development in Ethiopia: Situation analysis and trends. ICARDA/ILRI Project Report. Nairobi, Kenya: International Center for Agricultural Research in the Dry Areas/International Livestock Research Institute.
- Legese G., Hailemariam Teklewold, Dawit Alemu and Asfaw Negassa, 2008. Live animal and meat export value chains for selected areas in Ethiopia: Constraints and opportunities for enhancing meat exports, Discussion Paper No. 12, ILRI.
- Legese, G., Haile, A., Duncan, A.J., Dessie, T., Gizaw, S. and Rischkowsky, B. 2014. Sheep and goat value chains in Ethiopia: A synthesis of opportunities and constraints. ICARDA/ILRI Project Report. Nairobi, Kenya: International Center for Agricultural Research in the Dry Areas/International Livestock Research Institute.

Annex

Annex A1: Financial Analysis Summary for Sheep Breeding in Bonga (in Birr)

Year	0	1	2	3	4	5	6	7	8	9	10
Capital	82,000										
Revenue		1,294,160	1,397,693	1,509,508	1,630,269	1,760,690	1,901,546	2,053,669	2,217,963	2,395,400	2,587,032
Expenses											
Feed costs		241,920	246,758	251,694	256,727	261,862	267,099	272,441	277,890	283,448	289,117
Veterinary costs		84,000	85,680	87,394	89,141	90,924	92,743	94,598	96,490	98,419	100,388
Other expenses		232,800	237,456	242,205	247,049	251,990	257,030	262,171	267,414	272,762	278,218
Purchasing cost of Sheep		350,000	367,500	385,875	405,169	425,427	446,699	469,033	492,485	517,109	542,965
Total Expenses		908,720	937,394	967,167	998,087	1,030,204	1,063,571	1,098,243	1,134,279	1,171,739	1,210,687
Gross Profit	(990,720)	385,440	460,298	542,341	632,182	730,487	837,975	955,426	1,083,684	1,223,661	1,376,345
Depreciation		4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Profit Before Tax		380,940	455,798	537,841	627,682	725,987	833,475	950,926	1,079,184	1,219,161	1,371,845
Profit tax (35%)		133,329	159,529	188,244	219,689	254,095	291,716	332,824	377,714	426,706	480,146
Net Profit	(990,720)	247,611	296,269	349,597	407,993	471,891	541,759	618,102	701,470	792,455	891,699
Net Present Value (10%)		1,766,965									
IRR		36.6%									

Annex A2: Financial Analysis Summary for Sheep Fattening in Bonga (in Birr)

Year	0	1	2	3	4	5	6	7	8	9	10
Capital	82,000										
Revenue		1,216,000	1,313,280	1,418,342	1,531,810	1,654,355	1,786,703	1,929,639	2,084,010	2,250,731	2,430,790
Expenses											
Feed costs		403,200	411,264	419,489	427,879	436,437	445,165	454,069	463,150	472,413	481,861
Veterinary costs		60,000	61,200	62,424	63,672	64,946	66,245	67,570	68,921	70,300	71,706
Other costs		184,800	188,496	192,266	196,111	200,033	204,034	208,115	212,277	216,523	220,853
Purchasing cost of Sheep		350,000	367,500	385,875	405,169	425,427	446,699	469,033	492,485	517,109	542,965
Total Expenses		998,000	1,028,460	1,060,054	1,092,832	1,126,843	1,162,143	1,198,787	1,236,833	1,276,345	1,317,385
Gross Profit	(1,080,000)	218,000	284,820	358,288	438,978	527,511	624,560	730,852	847,177	974,386	1,113,405
Depreciation		4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Profit Before Tax		213,500	280,320	353,788	434,478	523,011	620,060	726,352	842,677	969,886	1,108,905
Profit tax (35%)		74,725	98,112	123,826	152,067	183,054	217,021	254,223	294,937	339,460	388,117
Net Profit	(1,080,000)	138,775	182,208	229,962	282,411	339,957	403,039	472,129	547,740	630,426	720,788
Net Present Value (10%)		949,145									
IRR		23.9%									

Annex A3: Financial Analysis Summary for Sheep Breeding in Doyogena (in Birr)

Year	0	1	2	3	4	5	6	7	8	9	10
Capital	82,000										
Revenue		1,386,600	1,497,528	1,617,330	1,746,717	1,886,454	2,037,370	2,200,360	2,376,389	2,566,500	2,771,820
Expenses											
Feed costs		225,288	229,794	234,390	239,077	243,859	248,736	253,711	258,785	263,961	269,240
Veterinary costs		84,000	85,680	87,394	89,141	90,924	92,743	94,598	96,490	98,419	100,388
Other expenses		232,800	237,456	242,205	247,049	251,990	257,030	262,171	267,414	272,762	278,218
Purchasing cost of Sheep		365,000	383,250	402,413	422,533	443,660	465,843	489,135	513,592	539,271	566,235
Total Expenses		907,088	936,180	966,401	997,801	1,030,433	1,064,352	1,099,614	1,136,280	1,174,414	1,214,080
Gross Profit	(989,088)	479,512	561,348	650,929	748,915	856,021	973,019	1,100,746	1,240,108	1,392,086	1,557,740
Depreciation		4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Profit Before Tax		475,012	556,848	646,429	744,415	851,521	968,519	1,096,246	1,235,608	1,387,586	1,553,240
Profit tax (35%)		166,254	194,897	226,250	260,545	298,032	338,982	383,686	432,463	485,655	543,634
Net Profit	(989,088)	308,758	361,951	420,179	483,870	553,488	629,537	712,560	803,145	901,931	1,009,606
Net Present Value (10%)		2,225,476									
IRR		42.9%									

Annex A4: Financial Analysis Summary for Sheep Fattening in Doyogena (in Birr)

Year	0	1	2	3	4	5	6	7	8	9	10
Capital	82,000										
Market Sheep		1,292,000	1,395,360	1,506,989	1,627,548	1,757,752	1,898,372	2,050,242	2,214,261	2,391,402	2,582,714
Revenue		1,292,000	1,395,360	1,506,989	1,627,548	1,757,752	1,898,372	2,050,242	2,214,261	2,391,402	2,582,714
Expenses											
Feed costs		375,480	382,990	390,649	398,462	406,432	414,560	422,851	431,308	439,935	448,733
Veterinary costs		60,000	61,200	62,424	63,672	64,946	66,245	67,570	68,921	70,300	71,706
Other costs		184,800	188,496	192,266	196,111	200,033	204,034	208,115	212,277	216,523	220,853
Purchasing cost of Sheep		365,000	383,250	402,413	422,533	443,660	465,843	489,135	513,592	539,271	566,235
Total Expenses		985,280	1,015,936	1,047,752	1,080,779	1,115,071	1,150,682	1,187,671	1,226,098	1,266,028	1,307,527
Gross Profit	(1,067,280)	306,720	379,424	459,237	546,769	642,681	747,690	862,571	988,163	1,125,374	1,275,187
Depreciation		4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Profit Before Tax		302,220	374,924	454,737	542,269	638,181	743,190	858,071	983,663	1,120,874	1,270,687
Profit tax (35%)		105,777	131,224	159,158	189,794	223,363	260,116	300,325	344,282	392,306	444,741
Net Profit	(1,067,280)	196,443	243,701	295,579	352,475	414,818	483,073	557,746	639,381	728,568	825,947
Net Present Value (10%)		1,379,718									
IRR		29.8%									

Annex A5: Financial Analysis Summary for Sheep Breeding in Menz (in Birr)

Year	0	1	2	3	4	5	6	7	8	9	10
Capital	82,000										
Revenue		1,201,720	1,297,858	1,401,686	1,513,821	1,634,927	1,765,721	1,906,979	2,059,537	2,224,300	2,402,244
Expenses											
Feed costs		195,048	198,949	202,928	206,986	211,126	215,349	219,656	224,049	228,530	233,100
Veterinary costs		84,000	85,680	87,394	89,141	90,924	92,743	94,598	96,490	98,419	100,388
Other expenses		232,800	237,456	242,205	247,049	251,990	257,030	262,171	267,414	272,762	278,218
Purchasing cost of Sheep		275,000	288,750	303,188	318,347	334,264	350,977	368,526	386,953	406,300	426,615
Total Expenses		786,848	810,835	835,714	861,524	888,305	916,099	944,950	974,905	1,006,012	1,038,321
Gross Profit	(868,848)	414,872	487,023	565,972	652,297	746,622	849,622	962,028	1,084,632	1,218,288	1,363,923
Depreciation		4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Profit Before Tax		410,372	482,523	561,472	647,797	742,122	845,122	957,528	1,080,132	1,213,788	1,359,423
Profit tax (35%)		143,630	168,883	196,515	226,729	259,743	295,793	335,135	378,046	424,826	475,798
Net Profit	(868,848)	266,742	313,640	364,957	421,068	482,379	549,329	622,393	702,086	788,962	883,625
Net Present Value (10%)		1,933,120									
IRR		42.5%									

Annex A6: Financial Analysis Summary for Sheep Fattening in Menz (in Birr)

Year	0	1	2	3	4	5	6	7	8	9	10
Capital	82,000										
Revenue		1,140,000	1,231,200	1,329,696	1,436,072	1,550,957	1,675,034	1,809,037	1,953,760	2,110,060	2,278,865
Expenses											
Feed costs		325,080	331,582	338,213	344,977	351,877	358,915	366,093	373,415	380,883	388,501
Veterinary costs		60,000	61,200	62,424	63,672	64,946	66,245	67,570	68,921	70,300	71,706
Other costs		184,800	188,496	192,266	196,111	200,033	204,034	208,115	212,277	216,523	220,853
Purchasing cost of Sheep		275,000	288,750	303,188	318,347	334,264	350,977	368,526	386,953	406,300	426,615
Total Expenses		844,880	870,028	896,091	923,108	951,121	980,171	1,010,304	1,041,566	1,074,005	1,107,675
Gross Profit	(926,880)	295,120	361,172	433,605	512,964	599,837	694,863	798,733	912,194	1,036,055	1,171,191
Depreciation		4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Profit Before Tax		290,620	356,672	429,105	508,464	595,337	690,363	794,233	907,694	1,031,555	1,166,691
Profit tax (35%)		101,717	124,835	150,187	177,962	208,368	241,627	277,982	317,693	361,044	408,342
Net Profit	(926,880)	188,903	231,837	278,918	330,501	386,969	448,736	516,251	590,001	670,511	758,349
Net Present Value (10%)		1,347,470									
IRR		32.0%									

Annex A7: Financial feasibility of the market information provision business (in Birr)

Year	0	1	2	3	4	5	6	7	8	9	10
Cash inflow											
Revenue from SMS		270,000	270,000	297,000	297,000	326,700	326,700	359,370	359,370	395,307	395,307
Revenue from Voice Call		1,620,000	1,620,000	1,782,000	1,782,000	1,960,200	1,960,200	2,156,220	2,156,220	2,371,842	2,371,842
Total Revenue		1,890,000	1,890,000	2,079,000	2,079,000	2,286,900	2,286,900	2,515,590	2,515,590	2,767,149	2,767,149
Cash outflow											
Server		30,000				40,500				54,675	
Inverter with battery		6,500				8,775				11,846	
Access point		2,500				3,375				4,556	
Furniture		10,000				13,500				18,225	
Printer		6,000				8,100				10,935	
Laptop (1 pc) and desktop computer (3 pc)		24,000				32,400				43,740	
VPN and ADSL Line		1,200				0				0	
Short code		10,355				0				0	
Fixed lines		190	190	190	190	190	190	190	190	190	190
Office Rent		60,000	60,000	63,000	63,000	66,150	66,150	69,458	69,458	72,930	72,930
Labour (3)		54,000	54,000	56,700	56,700	59,535	59,535	62,512	62,512	65,637	65,637
Short code rent		57,960	57,960	57,960	57,960	57,960	57,960	57,960	57,960	57,960	57,960
Miscellaneous		10,000	10,000	10,500	10,500	11,025	11,025	11,576	11,576	12,155	12,155
Total cost		272,705	182,150	188,350	188,350	301,510	194,860	201,696	201,696	352,850	208,873
Gross Profit		1,617,295	1,707,850	1,890,650	1,890,650	1,985,390	2,092,040	2,313,895	2,313,895	2,414,299	2,558,276
Depreciation		15,800	15,800	15,800	15,800	21,330	21,330	21,330	21,330	28,796	28,796
Profit Before Tax		1,601,495	1,692,050	1,874,850	1,874,850	1,964,060	2,070,710	2,292,565	2,292,565	2,385,503	2,529,480
Profit tax (35%)		560523	592218	656198	656198	687421	724749	802398	802398	834926	885319
Net Profit	-272,705	1,040,972	1,099,833	1,218,653	1,218,653	1,276,639	1,345,962	1,490,167	1,490,167	1,550,577	1,644,162
Net Present Value		6,940,311									
IRR		388.0%									