Haramaya University, Sheep and Goat Fattening and Breeding Project: A template.

Introduction

Livestock population survey results conducted by CSA (2007/08) estimate the sheep and goat population of Ethiopia to be about 26.1 and 21.7 million head, respectively. This does not include seven zones of the Afar and Somali regions, mainly pastoral areas that traditionally have high livestock numbers, which has the potential to substantially increase these population estimates. Sheep and goats command a strong position in the live animal and meat export trade to countries in the Middle East with future high market opportunities. This is partly because Ethiopian meat can be categorized as high quality, organic meat as it is not exposed to industrial pollutants like in industrialized nations.

However, low carcass weight and yield from both species limits potential for export as well as the availability of meat to fulfill the increased domestic demand for small ruminant meat. Due to poor muscle development, such carcasses have poor conformation and quality, which results in a low price given in the competitive market. This and other problems call for investment and improved management in many aspects of sheep and goat production in order to improve the productivity of these species on a sustainable basis. One needed improvement is the formation of planned business oriented breeding and fattening programs. A planned breeding program may include selection within the indigenous breed and a crossbreeding program between indigenous and adaptive exotic breeds with better genetic potential. Fattening or finishing programs will improve the animal body condition, carcass conformation and quality making these carcasses more competitive in local and export markets.

Haramaya University (HU) is currently upgrading its livestock farms to the level of business enterprises to better provide three basic services:

- To serve as a model farm for teaching
- To facilitate staff and student research activities
- To generate revenue from the farms making them self-sufficient and profitable enterprises

To achieve these objectives, the University is investing in its farms. Investing in a farm is often an expensive undertaking and can be financially stressful. Taking this aspect into consideration, creating a business plan is an essential step for any enterprise regardless of the size of the business. Business plans can serve as a road map to chart the course of the business.

The most critical problem confronting low-income farmers today is the need to maintain an adequate level of income. To combat this problem, farmers are diversifying into high value specialty crops and animals. In the present scenario, globally, diversification into alternative enterprises appears to be gaining popularity and economic importance as one way to boost an enterprise or increase family income. This is supported by the national policies of the Federal Democratic Republic of Ethiopia which encourages diversified
activities. Diversified enterprises can be profitably integrated into small scale operations benefiting both rural and urban groups of entrepreneurs. Haramaya University can benefit through boosting its revenue generation and improving teaching and research quality through sheep and goat breeding and fattening projects. Moreover, the surrounding community will benefit from the breeding and fattening enterprises in various ways.

The current business plan considered and addressed the following in order to improve and transform the sheep and goat business into a profitable self supporting enterprise:

- **Lesson:** This project will help us to learn a lesson from earlier setbacks. In the process of preparing this project, we learned how to negate factors that caused earlier setbacks. The project, therefore, helped us improve and generate positive and sustainable results.

- **Pragmatic approach:** In the past, these farms had a number of problems related to finance and management. Therefore, with an optimistic approach we hope this project will benefit from the introduction of innovative management, economic, financial and advanced scientific measures to overcome those drawbacks and to make this venture a sustainable operation.

- **Unreliable financial support:** In the past, the sheep and goat farms funding was mainly dependant on short term projects. The financial structure of the farms fluctuated with availability of project funds. This financial instability prevented the smooth operation of the sheep and goat farms. The current project plan will enhance the introduction of innovative management, economic and financial measures to overcome those drawbacks and to produce sustainable business plan.

- **Mission objective:** Resource optimization and maximization to achieve sustainable development goals.

- **Goal/Vision:**
  - To embark on a sustainable plan to achieve a reliable source of organic small ruminant meat for the local, regional, national and international market
  - To be leader in the supply of organic small ruminant meat. This vision is strongly supported by the conditions presently prevailing in Ethiopia, i.e., a total agrarian based economy with low levels of release of industrial effluents and other pollutants which are either directly or indirectly affecting meat quality and its impact on health of the consumer.

- **Historical reasons:** Historical evidence shows that Ethiopia was the “Bread Bowl” for the Roman Empire in ancient days. As in the past, Ethiopia can also be a good quality meat exporter to show that history repeats.

- **Linkage effect of the project:** There is a possibility of linking this project with the community in order to improve livelihood. The linkage effect of the current project could be reflected in the following areas.
  - **Nutrition and health:** To generate a source of nutritional and health improvement, especially for local population.
  - **Socioeconomic aspect:** Poverty alleviation for disadvantaged farmers especially women.
  - **Sustainability aspect:** Income generation, capacity building and human resource development.
Innovation: Small ruminants breeding and fattening can be linked with microfinance.

Haramaya University Goat and Sheep Enterprise history and ownership

The Haramaya University Small Ruminant Farm consists of the Sheep and Goat Farms both of which are situated on the main campus. The Sheep Farm was established way at the opening of the Animal Science Department in the 1960s to support small ruminant teaching and research activities. The Goat Farm was established in 1988 through an agreement between FARM-Africa and the Ministry of Agriculture for a dairy goat development project. The primary objective of the Goat Farm was to serve as a breeding center. The center produced crossbred goats (Anglo-Nubian×Somali) that were distributed to the community, particularly women, to increase income generation through improved milk production.

The infrastructure and management of the Sheep Farm has been remained poor and has served as a teaching and research center since its establishment. The Goat Farm has been better equipped and managed. Unlike the Sheep Farm, the Goat Farm has impacted the community during the last 20 years through distribution of crossbred goats to female farmers. Further, different research activities have been undertaken by Haramaya University and other university’s students using different goat breed crosses.

However, the capacity and service of the Goat Farm has diminished, particularly after the FARM-Africa project ended. The decline was attributed to financial constraints and poor management practices. These have resulted in decreased numbers of animals, particularly purebred exotic animals. The new business plan aims to stimulate and transform sheep and goat production into a sustainable self-supporting enterprise that generates revenue and support quality research and teaching.

General objective

- The main objective of the project is to evaluate the economic potential of the existing Sheep and Goat Farms by estimating the investment requirements, production costs and returns for the purchase and sale of high quality sheep and goat for fattening and for the breeding program of both sheep and goat farms for a period of five years.
- To provide baseline information and guidelines for future project development of crossbred goats and sheep so as to provide an economic incentive for enterprising entrepreneurs in the rural and urban centers.
- To develop a project that will serve as a template to attract more investors towards similar businesses.
**Specific objectives**

- To make the goat and sheep project economically viable by regularly undertaking fattening of purchased and farm-born male offspring having superior growth and carcass characteristics.
- To generate herds of crossbred female and male kids for marketing and distribution to smallholder producers and private firms on a profitable basis.
- To provide modern research and developmental facilities for the scientists and students of Haramaya University.
- To make the goat and sheep project profitable by introducing effective management practices.
- To harness the special skills of the staff related to animal sciences, veterinary science, management and social sciences for the development of both farms on a sustainable basis.
- To make Haramaya University a business hub with a vision and mission to establish a Centre of Excellence in Sheep and Goat Research that will breed and distribute animals of high genetic potential to enterprising groups from rural and urban centers for rearing and consequently play the role of a buy-back facilitator.
- To promote an ultra-modern, state-of-the-art abattoir, meat and meat product production center meeting international standards for domestic consumption and for international export.
- To identify and market other related product lines such as milk, manure, skin and other by-products from small ruminant production.
- To develop a model goat and sheep enterprise project which will attract more investors in sheep and goat breeding and fattening businesses to fulfill the large domestic and international demand for sheep and goat meat.
- To contribute towards the process of diversification of economic activities, that is aligned with government policies, through this project and similar project which use this as a model.
Rationale for establishing a small ruminant breeding and fattening enterprise

- To enhance the income generation potential of smallholder farmers.
- To optimize the efficient use of pastoral and agro-pastoral lands for small ruminant production.
- Create employment opportunities in farmer households by introducing community level adoption schemes based on community impact workshops.
- Link women farmers, small ruminants and microfinance in an innovative scheme by providing women entrepreneurs the opportunity to rear small ruminants in open grasslands.
- Introduce systems of cooperatives to target village economic constraints of small ruminant production.
- Use small ruminant products to enhance family nutrition and health of children.
- Poverty and gender alleviation for economically vulnerable groups, especially women farmers.
- Transfer and share technological improvements achieved through research and academic pursuits.

**Aspects of innovation**

- **Innovation**
  - Project linked with microfinance

- **Socioeconomic policy**
  - Establishment of cooperatives in the small ruminant farming sector
  - University can play lead role in the small ruminant farming sector by transfer and sharing of technological improvements achieved through research and academic pursuits

- **Poverty and gender alleviation**
  - for the economically vulnerable groups especially the women farmers

- **Production of sheep and goat milk**
  - which can supplement the malnourished diet of the Local population

- **Nutrition and health**
  - To generate a source of nutritional and healthy diet for the local population
The concept of sustainable development encompasses three main points (Munasinghe, 1993). This study identifies some of the key constituent elements of sustainomics and how they help to build a strong linkage between these three aspects of sustainability.

1. **Economic:** Growth – Efficiency – Stability
2. **Social:** Empowerment – Inclusion/Consultation - Management
3. **Environmental:** Resilience – Natural resources - Pollution

**Economic:** Economic welfare is evaluated in terms of willingness to pay for goods and services consumed, especially for good quality products. Most economic policies are directed towards enhancing income and induce more efficient production and consumption which, in this project, is represented in both the short-run and long-run as high quality products (animals) are distributed regularly to the community. This economic efficiency will improve the welfare of the local farmers (Pareto Optimality).

**Social:** Social development is the improvement in both individual well-being and the overall welfare of society, which is in line with equity and poverty alleviation. The social aspect in this study is expected to be vulnerability and how to improve equity and ensure that basic needs are met. The social domain focuses on the enrichment of social relations by helping downtrodden farmers through the supply of genetically superior animals.
These animals will have the ability to produce over an extended period of time, providing products that will sell at a favorable price to provide sustained financial support. Another aspect is reducing the vulnerability and maintaining health (resilience, vigor and organization) of social and cultural systems by empowering rural women.

**Environmental:** The environmental domain emphasizes the protection of the integrity and resiliency of ecological systems. This objective is very critical and important in the view of the Ethiopian environment as it is suitable for the production of organic meat which has a good marketing potential both domestically and internationally.

**Strategic marketing and pricing policy**

- **Pricing policy**
  - Dual Pricing
  - I.e. Subsidized and affordable price for the Local Market and a compensating price for the international market

- **Quality Management**
  - Organic Small ruminant meat standardized to meet the HACCP norms recognized by FAO/WHO

- **Creation of demand**
  - By encouragement and patronization for the product produced in these farms

- **The most important goal is to make small ruminant meat of Ethiopian origin a recognizable brand in the local and international market**

- **The Quality should be safe with no trace of elements or any other factors affecting the quality of the meat and health of the consumers**

- **To make small ruminant meat produced locally advantageous over the meat products produced in the developed nations**
Proposed financing

Haramaya University will finance the initial project investment and operating costs until the end of the second year. Different projects conducted at the Sheep and Goat Farms, such as the Breeding, Evaluation and Distribution Site at HU of the ESGPIP, are considered as sources of financing since some of the fixed costs, such as buildings, purchase of foundation stock etc., are made available to the project as per the agreement with HU. Starting from years three through five, the Sheep and Goat Farm is expected to finance itself from its net income. The estimated funds that would be provided to the proposed HU sheep and goat enterprise will enable it to meet its initial investment and initial years’ operational costs. Funds will be used to finance land and forage development, construction and maintenance of buildings, purchase of equipment and purchase of breeding stock.

Management and organization

The University Revenue Generation Department and the Department of Animal Sciences are primarily responsible for the management and coordination of the sheep and goat enterprise and research project. The project management will have a separate manager accountable to the above departments. The Sheep and Goat Farm will have research and teaching support and revenue generation mandates. The project will have its own independent staff possessing technical as well as managerial skills. The project also requires collaboration of several different faculties and departments in the University like the Veterinary Medicine, Business and Economics, Finance and Budget Division, Research and Extension Office, etc.

Products, service, market and competitors

Products/services
Taking the existing problems into account, the project intends to offer a range of breeding and fattening activities of small ruminants of different ages and breed types. The main course of activity is divided into goat and sheep farming, which involves breeding, fattening/meat production, milk production (in the intermediate period) as well as a range of value addition and byproducts such as manure, skin, and offal. In addition, the project will also provide training services for farmers groups, cooperatives, private investors or others who are planning to enter sheep and goat businesses. The project will provide research opportunities for University scientists and students and other national and international institutions, NGO, universities and research centers, as well as an extension service for local farmers and others.
**Market Analysis**

**Opportunities, market inflow and out flow, target customers, past supply and present demand**

Livestock and livestock products marketing is one of the major activities in the project region. Trading is almost entirely private, mainly smallholder producers, with no involvement of the public sector. There are few restrictions and control of livestock marketing, but local authorities have some regulations and charge fees. Traders and brokers operate at all segments of the market. Moreover, stock movement between markets is largely unregulated. The peculiar livestock production system in the project region is the pastoral production system that is based on extensive grazing of communal land. Animals supply milk for family subsistence. There is strong traditional livestock fattening in the intensively cultivated mixed production system in the highland areas of the region. These production systems are acknowledged for possessing better quality indigenous sheep and goat breeds, which can serve as a supply of breeding stock for breed improvement programs.

Currently, small ruminant production is one of the most profitable enterprises in Ethiopia. There is a huge demand for small ruminant meat, milk, skin, manure and other byproducts. However, there is little quantitative information on the milk and meat production characteristics of Ethiopia's indigenous sheep and goat breeds. Goat milk is highly valued among the societies where it is consumed entirely by the family. When sold, goat milk fetches a higher price than cow milk. The amount of milk produced by goats and sheep varies tremendously. The major factors as defined by the owners to affect production are season and breed.

Sheep and goat meat is favored by many Ethiopians as a major component of their daily diet and there appears to be a shortage of the product especially during religious holidays and other festivals such as weddings. Thus, the local market for finished sheep and goats is promising. The current local market price of these animals is reported to be highest ever recorded. The local market does not restrict itself to selling in the project region but also to major cities like Addis-Ababa where there is potential to market large numbers of animals. Furthermore, the expansion of modern supermarkets in big cities and the demand for processed and packed sheep and goat meat is encouraging increased interest in meat processing and packaging. In Ethiopia, there are 6 export and 92 municipal abattoirs. Traders and butchers usually purchase sheep, goats and cattle. Fattened sheep and goats can be easily exported to Djibouti and the Middle East through Dire Dawa, a town located about 40 km from the proposed project site, which can be facilitated through contract farming with the existing potential exporters. The current improved disease prevention measures and increase coverage of veterinary service will also promote export of live animals and their products to the Gulf States and Middle East. Moreover, establishing a contractual agreement between trading firms or with those involved in the production of similar products can open access to new markets.
Past Supply and Present Demand

Table 1 depicts total exports of meat and meat products during the period 1997 - 2006. Recent developments reveal remarkable growth in the exports of meat from the country. According to the Ethiopian Meat Producers and Exporters Association, on average, 2979.21 tons of meat and 6396.19 tons of livestock were exported annually to the Middle East from 1997 to 2006. The Association expects continued increases in meat and live animal export in the coming years.

Table 1. Export of meat and live animals

<table>
<thead>
<tr>
<th>Year</th>
<th>Cattle, sheep and goat meat export (metric tons)</th>
<th>Cattle, sheep and goat live animal export (Metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>1716.4</td>
<td>1304.7</td>
</tr>
<tr>
<td>1998</td>
<td>1529.4</td>
<td>1323.6</td>
</tr>
<tr>
<td>1999</td>
<td>2078.3</td>
<td>918.9</td>
</tr>
<tr>
<td>2000</td>
<td>1976.8</td>
<td>1766.3</td>
</tr>
<tr>
<td>2001</td>
<td>869.7</td>
<td>214.1</td>
</tr>
<tr>
<td>2002</td>
<td>662.5</td>
<td>165.7</td>
</tr>
<tr>
<td>2003</td>
<td>1722.2</td>
<td>607.1</td>
</tr>
<tr>
<td>2004</td>
<td>4007.0</td>
<td>3141.4</td>
</tr>
<tr>
<td>2005</td>
<td>7274.5</td>
<td>21226.0</td>
</tr>
<tr>
<td>2006</td>
<td>7955.3</td>
<td>33294.1</td>
</tr>
<tr>
<td>Total</td>
<td>29,792.1</td>
<td>63,961.9</td>
</tr>
<tr>
<td>Average</td>
<td>2979.21</td>
<td>6396.19</td>
</tr>
</tbody>
</table>

Source: National Bank of Ethiopia (NBE), Annual Reports.

Within the region, the focal points for small ruminant consumption are the towns of Dire Dawa, Jijiga and Harer with populations of 822,000, 369,523 and 131,000, respectively. This illustrates the potential market for small ruminant products in the region. However, due to the long dry season, which lasts for more than 6 months in a year, insufficient quantity and quality of animals is supplied to Harar, Dire Dawa, and the surrounding small towns found in East and West Harerge zones. These types of animals have low
market value since they are not demanded for immediate use by urban dweller, butchers and exporters. If these animals are provided with health care and high energy ration under feedlot conditions, their body weight and condition will be improved during the proposed fattening period and hence, it is possible to supply improved quality products to the residents at a reasonable price.

**Market segmentation**
The project will supply:
- Female sheep and goats of improved genotypes to farmers around Harari region, Dire-Dawa and East and West Harerge zones of Oromiya.
- Fattened goats and sheep for farmers, urban dwellers and export.
- Goat milk for customers at Haramaya University and in Harar and Dire Dawa beginning after the mid-term of the project.
- Processed and packed mutton and chevon to consumers on Haramaya University campus and supermarkets in the region starting during the last term of the project.

**Competitiveness on the market and competitors**
Since agricultural market is a proxy for competitive market, the expected market for the products of the project will get high competition from local farmers, private farms engaged in similar activities around East and West Haragghea region of Oromiya, Hareri Region, Dire Dawa Town, Somali Region and other areas of the country. The major difference between products supplied by the project and those supplied by competitors is that the product supplied by the project will be well managed, free of diseases and at the age and quality demanded by customers.

**Technology**
In order to carry out its activity, the project will use exotic breeds for crossbreeding and artificial insemination purposes. In addition, higher quality indigenous breeds of sheep and goats will be used both for crossbreeding and fattening programs. Furthermore, best management practices and veterinary service will be in place in order to supply superior quality products and services to customers. In general, up-to-date technologies and research results are assumed to be utilized by the project.

**Competitive strategy**
Marketing functions or services include many phases such as assembling small ruminants from local farmers, managing them to a required product, transporting to potential markets and distributing them to customers, such as export agencies, hotels, and restaurants. In economic terms, the utility of time, place and form will be added so that acceptable products will be offered to the ultimate consumer at the required time.

**Production and pricing strategy**
The major objective of the project is to produce small ruminants to maximize profit and make the project sustainable. To achieve this objective, consideration of production and
other costs that determine profitability is necessary. Haramaya University is situated in a transitional zone between the lowlands of Eastern Ethiopia and the Eastern plateau, where the Ogaden breed of sheep and goats are produced. Ogaden sheep and goats are relatively larger in size and have acceptable conformation for meat production and demand for export versus highland sheep and goats that have high demand in the local market. Therefore, sheep and goats of Ogaden and Hararghe highland types can be supplied for the project at a relatively lower cost for fattening and breeding purposes.

In addition, the profit from small ruminant production is attained by minimizing feed costs which account for more than half of the total cost of production. Any attempt to improve commercial small ruminant production and increase its efficiency, therefore, needs to focus on better utilization of available feed resources. Accordingly, the Haramaya University farm has 10 hectares of land used for grazing and forage production. In addition, the project can also purchase feed from Haramaya University’s feed processing. Through using these resources the cost of production will be lower than that of commercial small ruminant farms in the country. In addition, the project will adjust the price of products supplied to the consumers based on types of animal and market research.

Promotion

To promote its products, the project will use different promotion means such as handbills and posters, press releases in local newspapers and magazines, and on radio and TV. In addition, seasonal promotions will be done especially for religious holidays. The promotion will be based on particular types of products prepared for each occasion.

Risk assessment

Risk analysis

A business oriented production approach will obviously encounter risks. However, the level of risks may differ from business to business. Most agri-business are vulnerable mainly because of the biological nature of their production system which makes them susceptible to natural changes such as weather, disease, pests, etc. Though small ruminant production is one of the most profitable businesses in the agriculture sector, there are various kinds of associated risks. The major risks associated with small ruminant business are:

- Diseases
- Change of weather condition
- Market problems for inputs and outputs

The major risk emanates from disease hazards and these diseases are mostly contagious. Once a disease event occurs, it is not only brings substantial physical loss of animals but also a simultaneous loss of demand for the product because of consumer negativity affecting tastes and product preference. Inputs for small ruminant businesses are labor, feed and feed processing units, medicaments and others. A market should be available for the inputs and for the outputs of the business, i.e., milk, crossbred and fattened live animals. If there is time lag between demand and supply of products and importable
inputs, the greater the risk for the business. In addition, during the dry season or if
drought occurs, the project could face feed shortages which can affect the project activity.
Instability of any kind may also disturb and have a negative consequent effect on the
implementation of this project. It may prevent the project from supplying products on
time and at the required quality as well as affecting marketing of the product to local and
export markets.

Exit strategies
In order to protect animals from possible diseases outbreaks, preventive measures should
be put in place through proper management such as supplying proper feed and clean
water and supplying veterinary services such as vaccination, medicaments and flock
monitoring. In order to supply necessary input at required times, the project management
will work hand in hand with the University Farm Management Department for supplying
feed and processing service, with the Veterinary Faculty to get timely surveillance and
professional support and with other departments of the University as needed. Production
activity will be based on an annual plan in such a way that there will be no time lag
between demand and supply of products. In addition, the marketing plan will be
developed based on market research. In order to avoid feed shortages during possible
drought periods, the project will have a reserve feed stock.

Financial analysis
Profit maximization is the overriding factor in most management decisions. Thus, an
economic profitability analysis is necessary to determine whether investing in a sheep
and goat production plan will result in profit in the long run. As a key component of a
business plan, budgeting is a management tool that helps the producer evaluate the
feasibility of a proposed venture and helps identify areas for improvement. Budgets can
identify the financial resources needed for both sheep and goat investment and annual
operating costs. Budgets can help managers make decisions based on realistic data.

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.
- Production and marketing risks will limit budget reliability. In spite of using
  best estimates, variability in production and prices may bring changes in
  budget estimation.
- Even under careful use, errors can compound themselves to the point where
  budgets have little or no use.
- In the farm sector in general, and in livestock production in particular, business
  plan decision making is complex. This is especially true when planning small ruminant
  production. Usually, margins are meager unless and until a strict regime is followed, i.e.,
  - Detailed assessment
  - Effective management
  - Avoidance of loss, i.e. loss making determinants should be assessed at an
    early stage to avoid major losses at a later stage.
Materials and methods used for analysis

- Two alternative production systems of fattening and breeding are considered in the project for both goat and sheep.
- Costs and returns for the two operations are calculated from biological and cost and revenue estimates used in a separate manner.
- Biological parameters are estimated for flock fertility at eighty percent and kid mortality at 9 percent.
- Fixed costs are estimated only for equipment and maintenance as the farms have already been established.
- Under operating costs, the primary component is feed cost which has been estimated separately for the fattening and breeding units. For breeding units, feed cost is estimated for early pregnancy, late pregnancy, lactation and during the open/dry period. In addition to this, a separate cost analysis is made for Buck/Ram.
- Revenue estimates are derived mainly from sale of kids, ewe/does and culled ewes/doe and buck/ram.
- Project worth analysis is estimated by analyzing cash flow estimates and Net Present Value at 7.5 percent discount rate.
- The above procedure will be used for the breeding unit and the same can be applied for preparation of a feasibility analysis report pertaining to the fattening unit.
- The expected returns for the fattening unit are encouraging whereas those for the breeding unit are below operating costs.
- Returns are not even sufficient to cover variable costs.
- The enterprise would not be self-supporting in the short run.
- If breeding of small ruminants is for improving the livelihoods of vulnerable populations, economics will play a lesser role in deciding whether to produce small ruminants.
- Many organizations may sacrifice short run returns to achieve long term social benefits.
- If it is viewed only as a profitable enterprise, the best decision may be to exit the enterprise and employ the resources in a different enterprise or investment.

Project financial feasibility analysis

Financial feasibility of the goat fattening unit

Estimations are presented for a goat fattening unit for 150 goats. Four cycles of fattening will be conducted annually for a total of 600 goats fattened. In order to know the feasibility of investing in a goat fattening business, costs are estimated as follows.
Table 2. Estimated fixed costs for the fattening unit

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Cost in ETB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Equipment &amp; Machinery</td>
<td>50,000</td>
</tr>
<tr>
<td>2</td>
<td>Renovating of existing building structure</td>
<td>50,000</td>
</tr>
<tr>
<td>3</td>
<td>Total</td>
<td>100,000</td>
</tr>
</tbody>
</table>

Table 3. Feed requirement and estimated costs per production cycle for fattening unit

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of feed</th>
<th>Concentrate</th>
<th>Forage</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount of feed required per goat per day</td>
<td>0.2</td>
<td>0.5</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>No. of goats per production season</td>
<td>150</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total feed quantity required per day</td>
<td>30</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total feed quantity required per production season (90 Days)</td>
<td>2700</td>
<td>6750</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost per Kg of concentrate and forage in ETB</td>
<td>2.80</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total estimated cost in ETB</td>
<td>7,560</td>
<td>6,750</td>
<td>14,310</td>
</tr>
<tr>
<td></td>
<td>Cost per unit of goat in ETB</td>
<td>50.4</td>
<td>45</td>
<td>90.40</td>
</tr>
</tbody>
</table>

Each production cycle is for three months (90 days)

Table 4. Human resource requirements for the fattening unit

<table>
<thead>
<tr>
<th>Job Description</th>
<th>Supervisor</th>
<th>Accountant</th>
<th>Daily farm labor</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of Employees</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Monthly Salary in ETB</td>
<td>1,500</td>
<td>500</td>
<td>450</td>
</tr>
<tr>
<td>Annual Salary</td>
<td>18,000</td>
<td>6,000</td>
<td>21,600</td>
</tr>
<tr>
<td>Remark</td>
<td>One person will be employed to manage all activities</td>
<td>One person will be employed to manage all activities</td>
<td>Four persons will be employed for feeding, cleaning and guarding.</td>
</tr>
<tr>
<td>Total expenditure on all Labor per Year in ETB</td>
<td>45,600</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Half of the costs are shared by the fattening unit. Hence share of expenditure for fattening unit is 22,800 in ETB.*
Table 5. Operation cost estimates for goat fattening for one year

<table>
<thead>
<tr>
<th></th>
<th>Cost per goat per production Season ETB</th>
<th>Total cost per production Season ETB</th>
<th>Total estimated cost per Annum ETB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed cost</td>
<td>90.40</td>
<td>13,560.00</td>
<td></td>
</tr>
<tr>
<td>Labor Cost</td>
<td>56.00</td>
<td>8,400.00</td>
<td>33,600.00</td>
</tr>
<tr>
<td>Health Care</td>
<td>10.25</td>
<td>1,537.50</td>
<td>6,150.00</td>
</tr>
<tr>
<td>Machinery Rent</td>
<td>18.33</td>
<td>2,750.00</td>
<td>11,000.00</td>
</tr>
<tr>
<td>Purchase of goat</td>
<td>300.00</td>
<td>45,000.00</td>
<td>180,000.00</td>
</tr>
<tr>
<td>Marketing cost</td>
<td>15.00</td>
<td>2,250.00</td>
<td>9,000.00</td>
</tr>
<tr>
<td>Tax</td>
<td>12.60</td>
<td>1,890.00</td>
<td>7,560.00</td>
</tr>
<tr>
<td>Insurance</td>
<td>5.00</td>
<td>750.00</td>
<td>3,000.00</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>10.00</td>
<td>1,500.00</td>
<td>6,000.00</td>
</tr>
<tr>
<td>Total</td>
<td>517.58</td>
<td>77,637.00</td>
<td>310,548.00</td>
</tr>
</tbody>
</table>

Financial feasibility of the goat fattening unit

A number of methods are used to study the feasibility of a unit. The most widely used statements are balance sheet, income statement and cash flow statement. Even among these, there are a wide variety of costs and revenues at different stages to be analyzed. But, in our project which is a restricted study, all assets are the livestock only and all revenues are derived from the sale of these animals. Hence, there are only two items in the present balance sheet.

1. Costs of all types
2. Revenues derived from the sale of animals.

Table 6. Balance Sheet projections

<table>
<thead>
<tr>
<th>No.</th>
<th>Assets</th>
<th>Liabilities</th>
<th>Net revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>600 goats @ ETB 650 = 39,0000</td>
<td>310,548.00</td>
<td>79,452.00</td>
</tr>
</tbody>
</table>

- This particular balance sheet shows a surplus of net revenue equal to ETB 79,452.
- One another method is used to provide additional information on financial progress, i.e. ratio analysis.
- The usefulness of ratios depends to a considerable degree on a reliable basis for comparison. This will determine whether the ratio for a particular farm is good, fair or poor. Here again, assets and liabilities are taken in terms of operating costs excluding other fixed costs.
- A classical measure of financial condition used in balance sheet analysis is the current ratio, which indicates the extent to which current assets, if liquidated, would cover current liabilities.
- Current Ratio = Total Assets/ Current Liabilities
- Current Ratio = 390,000/310,548.00 = 1.26
- This ratio reveals that the current assets cover the current liabilities by 1.26 times. Usually an ideal current ratio of two times or 2:1 is suggested in business which is
ideal to manufacturing industries, but in businesses like livestock farms, it depends on the sales generated.

- Higher ratios are always preferred.

**Important terms**

- **Income Statement:** An income statement is also a summary of receipts and gains during a specified period, usually a year.
- **Receipts:** Receipts are derived from annual sales. Here, the only source of revenue is through sales of goats.
- **Expenses:** All expenses involved in the operation of the business during the year are considered. This includes fixed as well as variable costs.
- **Net income:** The difference between the receipts and costs is considered as net income. For large enterprises, three types of income are considered, i.e., net cash income, net operating income and net farm income. In our study net cash income is considered as ETB = 79,452.
- **Income statement ratios:** One of the income statement ratios is expense to income ratio used to measure the input – output efficiency of the business, i.e., measure the margin by which the value of total production exceeds production costs. Controlling expenses in relation to income is key to a profitable farm
- **Operating ratio:** Total operating expenses/Gross income
- **Fixed ratio:** Fixed ratio = Fixed expenses/Gross income. Here it is 100,000/39,000 = 0.26. Fixed expenses amounted to 26 cents per Birr of gross income.
- **Cash flow Statement:** It is all cash transactions affecting the business during a year which is obtained by cash receipts minus cash payments. This source is also limited, i.e., goats are sold after every quarter. Projections for this unit equal ETB = 79,452.
- From all these statements, this unit is promising and hence we can start establishing the unit.
- Assuming the costs of inputs and the market price of output will rise proportionately through the project life, the project feasibility analysis is was performed using a discount rate of 7.5 percent to analyze the net present value of goat 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, this investment is acceptable.
- However, the project worth analysis for breeding unit is not so promising at least for three years. The details of the breeding unit is furnished below
Financial feasibility of the goat breeding unit

Table 7. Basic biological parameters for estimating costs and returns

<table>
<thead>
<tr>
<th>Biological parameters</th>
<th>Estimation</th>
<th>Maximum Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flock fertility rate</td>
<td>85 %</td>
<td>100</td>
</tr>
<tr>
<td>Kid mortality rate</td>
<td>9 %</td>
<td>-</td>
</tr>
</tbody>
</table>

Operating costs are estimated separately for pregnant does, late pregnancy, lactation period and the dry period. In addition, operating costs are separately estimated for bucks and for kids.

Table 8. Consolidated summary of total feed costs for 215 goats and for 155 kids

<table>
<thead>
<tr>
<th>No.</th>
<th>Feed cost for 200 Pregnant Does</th>
<th>Feed cost for 15 Bucks</th>
<th>Feed cost for 155 Kids</th>
<th>Total costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>50,514.00</td>
<td>7,172.25</td>
<td>17,391.00</td>
<td>75,077.25</td>
</tr>
</tbody>
</table>
Table 9. Operating cost estimates for pregnant does

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Cost per unit</th>
<th>Feed cost per goat</th>
<th>Total feed cost for 200 goats</th>
<th>Total cost for three months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Feed cost for early pregnant doe (ETB)</td>
<td></td>
<td>0.10</td>
<td>2.80</td>
<td>0.28</td>
<td>56.00</td>
</tr>
<tr>
<td></td>
<td>Concentrate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forage</td>
<td>0.25</td>
<td>1.00</td>
<td>0.25</td>
<td>50.00</td>
<td>4,500</td>
</tr>
<tr>
<td>2.</td>
<td>Feed cost for Does in late pregnancy</td>
<td></td>
<td>0.15</td>
<td>2.80</td>
<td>0.42</td>
<td>84.00</td>
</tr>
<tr>
<td></td>
<td>Total cost for two months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Concentrate</td>
<td></td>
<td>0.25</td>
<td>1.00</td>
<td>0.25</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td>Forage</td>
<td>0.25</td>
<td>1.00</td>
<td>0.25</td>
<td>50.00</td>
<td>3000</td>
</tr>
<tr>
<td>3.</td>
<td>Feed cost for Does during nursing</td>
<td></td>
<td>0.20</td>
<td>2.80</td>
<td>0.56</td>
<td>112.00</td>
</tr>
<tr>
<td></td>
<td>Total cost for four months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Concentrate</td>
<td></td>
<td>0.25</td>
<td>1.00</td>
<td>0.25</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td>Forage</td>
<td>0.25</td>
<td>1.00</td>
<td>0.25</td>
<td>50.00</td>
<td>6,000</td>
</tr>
<tr>
<td>4.</td>
<td>Feed cost for does during dry season</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total feed cost for three months</td>
<td></td>
<td>0.15</td>
<td>2.80</td>
<td>0.42</td>
<td>84.00</td>
</tr>
<tr>
<td></td>
<td>Concentrate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forage</td>
<td>0.50</td>
<td>1.00</td>
<td>0.50</td>
<td>100.00</td>
<td>9000</td>
</tr>
<tr>
<td>5.</td>
<td>Feed cost for bucks 15</td>
<td></td>
<td>0.20</td>
<td>2.80</td>
<td>0.56</td>
<td>8.40</td>
</tr>
<tr>
<td></td>
<td>Total feed cost for one year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Concentrate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forage</td>
<td>0.75</td>
<td>1.00</td>
<td>0.75</td>
<td>11.25</td>
<td>4,106.25</td>
</tr>
<tr>
<td>6.</td>
<td>Total feed cost for does and bucks for one year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 10. Operating cost estimates for kid feeding for six months

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of feed</th>
<th>Quantity</th>
<th>Cost per unit</th>
<th>Cost per kid</th>
<th>Feed cost for 155 kids</th>
<th>Total cost during lactation period of four months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Concentrate</td>
<td>0.05</td>
<td>2.80</td>
<td>0.14</td>
<td>21.70</td>
<td>2,604.00</td>
</tr>
<tr>
<td></td>
<td>Forage</td>
<td>0.15</td>
<td>1.00</td>
<td>0.15</td>
<td>23.25</td>
<td>2,790.00</td>
</tr>
<tr>
<td>2.</td>
<td>Concentrate</td>
<td>0.20</td>
<td>2.80</td>
<td>0.56</td>
<td>86.80</td>
<td>7,812.00</td>
</tr>
<tr>
<td></td>
<td>Forage</td>
<td>0.30</td>
<td>1.00</td>
<td>0.30</td>
<td>46.50</td>
<td>4,185.00</td>
</tr>
<tr>
<td>3.</td>
<td>Total feed cost for 155 kids for seven months</td>
<td></td>
<td></td>
<td></td>
<td>17,391.00</td>
<td></td>
</tr>
</tbody>
</table>

Table 11. Operating cost estimates for goat breeding unit for one year

<table>
<thead>
<tr>
<th></th>
<th>Total No of goats</th>
<th>Total cost for 200 goats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase price of breeding goats @ ETB300</td>
<td>200</td>
<td>60,000</td>
</tr>
<tr>
<td>Purchase price of breeding bucks @ ETB1000</td>
<td>15</td>
<td>15,000</td>
</tr>
<tr>
<td>Labor cost for one year</td>
<td>215 + 150</td>
<td>22,800</td>
</tr>
<tr>
<td>Health care for all goats @ ETB10.25 (215 + 155)</td>
<td>215 + 155</td>
<td>3,792.50</td>
</tr>
<tr>
<td><strong>Total Feed cost</strong></td>
<td><strong>215 + 155</strong></td>
<td><strong>75,077.25</strong></td>
</tr>
<tr>
<td>Marketing costs @ ETB 15 for 155 kids</td>
<td>155</td>
<td>2,325.00</td>
</tr>
<tr>
<td>Miscellaneous expenses for all goats</td>
<td>215 + 155</td>
<td>25,000</td>
</tr>
<tr>
<td><strong>Total expenses</strong></td>
<td></td>
<td><strong>204,148.00</strong></td>
</tr>
</tbody>
</table>

Unlike the fattening unit, the breeding unit generates a small amount of revenue per year. This is partly because there is only one lamb/kid crop per doe/ewe per year. However, after five years when breeding does and bucks are sold, a substantial amount of revenue can be generated. The main objective of this project is to help the farmers by distributing high quality animals.

1. Costs of all types= ETB 204,148.00
2. Revenue derived from the sale of 155 kids= ETB 93,000
Table 12. Balance sheet projections

<table>
<thead>
<tr>
<th>No</th>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>155 Kids @ ETB 600 = 93,000</td>
<td>204,148.00</td>
</tr>
<tr>
<td>2</td>
<td>A Deficit of ETB-111,148</td>
<td>---</td>
</tr>
</tbody>
</table>

- Current Ratio = Total Assets/ Current Liabilities
- Current Ratio = 93,000/204,148.00 = 0.46
- This ratio reveals that the current assets do not cover current liabilities.
- Operating ratio = Total operating expenses/ Gross income
- In our present study operating ratio = 204,148.00/93,000.00 = 2.20
- Usually this ratio should be as small as possible.

Due to the continuous deficit which has been estimated for the goat breeding unit, the possible remedies to minimize the losses are:
- They are profitable if rangelands are sufficiently available.
- The only cost component is feed cost. If possible, make arrangements with the legal pastoral land occupants for continuous supply of feed at a subsidized rate.
- Production can be improved by improvement in rangelands/cultivate pastures/ crop residue utilization.
- Introduce buy-back facilities involving local dynamic potential farmers in arranging feed supply.
- Involve local villagers where 1-5 heads can be raised in intensive crop cultivation areas.
- Improve overall, and particularly reproductive, management so that two crops or at least three kids/two does in a year is possible.
- Keep labor and breeding does and buck costs under fixed costs. Furthermore, one other possibility to make the unit as profitable as possible is estimating only feed costs as operating costs with the rest of the costs as fixed costs. This would provide a margin.

**Conclusion**

Based on the financial results from the two units, one of the critical components where financial loss is occurring is the feed cost, which has a large influence on the performance of the enterprise resulting in either loss or a small profit.

**Possible remedy: Feed resources and feed management.**

1. To make Haramaya University Sheep and Goat Production (HUSGP) a sustainable unit, identification of feed production source is very important. The availability of rangelands, which is around 62% of the total land area of the nation, is an option for feed production. Involving the farming communities who depend for their livelihood on these rangelands is a viable and good proposition.
2. Involve rural people in forage development by introducing training and assistance by Haramaya University. One interventions of the university is to supply strategically selected forage species with multiple uses (food, fuel and fodder) which can withstand weather calamity.

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3. Technological support for the maintenance of traditional sustainable natural grazing land used by the local community who can enroll as beneficiaries and members of HUSGP for sustainable and improved rangeland management.
4. Encourage rural people to use genetically superior HU animals.
5. Training facilities must be extended to local farmers especially with high school education level to train them in para-veterinary skills to handle emergencies.
6. Transfer improved management practices to farmers to improve their livelihood.
7. Organize women’s groups to form cooperatives with a common objective of establishing sheep and goat farms. Provide them with training improved management.
8. Encourage and promote the traditional sustainable natural grazing lands to support small ruminant production by local community. This is a neglected sector in animal production in Ethiopia.
9. Encourage successful rangeland development through interventions of technically, socially and economically advanced skills.

**Establishment and building of brand image**

1. Establishment and building of a brand image is an important in making the sheep and goat unit a sustainable business enterprise. This can be achieved by following a strict regime of quality control and introduction of a wide variety of standardization techniques and principles.
2. Use an awareness campaign focusing on the safety and nutrient content of small ruminant meat, e.g., low cholesterol, low sodium, etc.
3. Slaughtering of animals in a modern and scientifically designed abattoir can add to the establishment of a brand image.
4. Sales promotion through establishment of a logo to avoid imitation, tamper-proof and attractive packaging should make customers aware of the benefits of quality and the unique value linked with the product. Advertising as a sales promotion tool to establish brand image is very important.
5. Finally, once the brand name is established there will be assured demand with a commanding price with cascading results beneficial to all stakeholders.
6. Two crucial aspects, cost minimization and revenue maximization, are the two components for the success of any enterprise from an economic point of view.

**Note:** Financial feasibility analysis for the sheep farm is similar to the example demonstrated above for the goat farm and can be calculated by adjusting cost and revenues pertinent to sheep fattening and breeding.