



Scaling Improved Sheep Fattening Practices and Technologies in Ethiopian Highlands

Sheep Fattening Business Case for Youth Groups

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Introduction

In close collaboration with Regional Agriculture Research Institutions and partners, ICARDA is scaling out improved sheep fattening practices and technologies in Ethiopia. The project aims to enhance incomes from sheep fattening.

Sheep farming is one of the lucrative commercial businesses in Ethiopia. With basic knowledge on sheep farming and management, farmers and youth in Ethiopia can be successful in sheep fattening and generate good revenue from the sector. Rural youths who are unemployed or those with marginal landholding can engage in sheep farming.

Sheep farming does not require much space and does not destroy trees like goats. With relatively low investment costs, sheep farming has quick returns as sheep can be sold at the age of 5 to 6 months or can be fattened within three to four months. Sheep meat has huge demand throughout the country and can be sold at very high prices during festive seasons.

Despite all potential benefits of sheep fattening, farmers are not getting optimum benefit from the sector. Youth unemployment is high in Ethiopia and most rural youth do not have access to land for production of crop and other agricultural outputs.

Therefore, it is important to carry out a cost and return analysis or profitability of sheep fattening as a means of creating youth employment and ascertaining the profitability of scarce resources used by the farmers to maximize their profit.

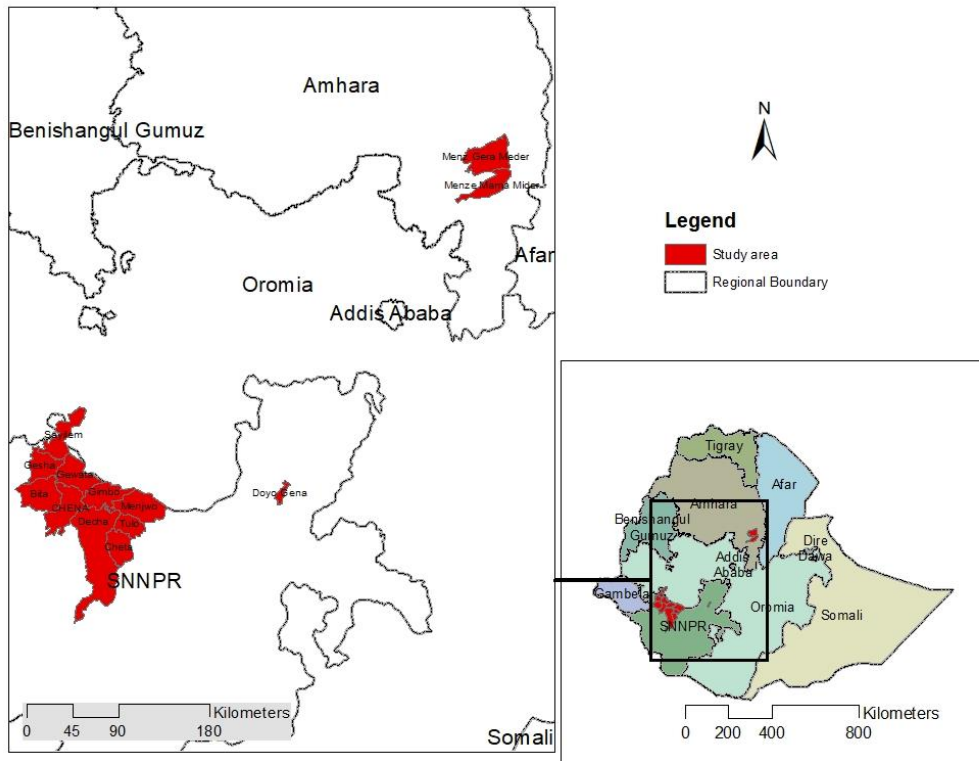
Materials and methods

The Study Area

The study was conducted in Doyogena district, Menz (Gera and Mama) district and Bonga, Kaffa zone where the sheep fattening project is under implementation. Doyogena is a district found in Kenbata and Tenbaro zone of SNNPR region, located 268km from the capital city, Addis Ababa. Menz gera and Menz mama districts are located in North Shewa zone of Amhara region approximately 280 km and 255 km from Addis Ababa respectively. Bonga is located in Kaffa zone, SNNPR region, 499 km Northwest of Addis Ababa.

Sources of Data

The study used both primary and secondary data. Primary data which involved the use of questionnaires and scheduled interviews. Previous studies on the sector and data from different actors were also used as a source of information. The information gathered includes those on fattening system of the study areas, socio-economic variables of the fatteners, cost of sheep fattening, including feed, returns on investment, production constraints and opportunities.



Analytical Techniques

Gross Margin Analysis (Budgeting Techniques): To evaluate profitability of sheep fattening in study area, budgeting techniques were used. The technique specifically used gross margin analysis through which the Net Fattening Income was obtained.

$GM = GI - TVC \dots\dots\dots (i)$

Where: GM = Gross Margin
 GI = Goss Income
 TVC = Total Variable Cost

$NFI = GM - TFC \dots\dots\dots (ii)$

Where: NFI = Net Fattening Income
 GM = Gross Margin
 TFC = Total Fixed Cost

Assumptions

The profitability analysis was conducted based on the following assumption

- Group fattening business
- Each group has 10 members
- Each youth will contribute one sheep to the group and the project will provide additional 10 sheep for the group with ten members and each group will have 20 sheep for start-up of the business.

Results and discussion

Sheep fattening system in the study area

In Ethiopia livestock production broadly classified into pastoral, agro-pastoral and mixed crop–livestock, peri-urban and urban production systems (Solomon et al 2010). In pastoral systems, extensive livestock production is mostly the sole source of livelihood with little or no cropping. In the sub moist/moist lowlands, agro-pastoralism is the main mode of production. Crop and livestock production are both important activities. Livestock production is a secondary enterprise in the highland mixed crop–livestock systems, although livestock assumes a major importance in areas where crop production is unreliable.

Sheep, in the study area are kept under traditional extensive systems, largely produced in mixed crop–livestock production systems. Sheep production is of subsistence nature. Market-oriented or commercial production is minimal. Smallholder sheep production is predominant in the highlands because of land and capital limitations. In the extensive systems, there is minimal purchase of inputs and feeds. In Bonga district, grazing land devoted to sheep or livestock production is too low and most fatteners manage on marginal lands. According to Solomon et al (2010), traditionally extensive systems of production share common characteristics such as limited number of animals per unit area, low productivity per animal, relatively limited use of improved technology and use of on-farm by-products rather than purchased inputs.

The major feed resources for sheep varies from area to area. In addition to grazing on communal and marginal land, farmers in Doyogena district also use wheat straw, desho grass, amicho/enset and potato (leaves and potato). Farmers in Menz area use faba bean straw, barley straw, wheat straw and bran, broken lentil, atela, wheat bran and noug cake as supplementary feedd for sheep fattening. Water sources include rivers, streams, ponds, deep well, pipe water and springs, while rivers are the major water sources. Sheep productivity is influenced by a complex interaction of the genetic potential of the breed, the production system and the production environment. Sheep breeds reared in the study areas are almost exclusively indigenous breeds (Doyogena, Menz and Bonga). The mode of production determines the level of productivity and production.

Family labor is the main source of livestock farm labor. Use of hired labor for flock management is minimal and uncommon. Thus, the amount of household labor available and the manner of labor allocation are critical to effectively carry out farm operation and influence livestock management techniques and adoption of improved technologies.

Characteristics of sheep marketing systems

Sheep are often trekked or transported on carts to marketplaces. A mix of cattle, sheep and goats are presented in typical livestock marketplace. In Doyogena, Menz and Bonga district, farmers market their sheep at farm gates or the nearest local/primary markets.

Profitability analysis

Profitability of any business is based on the relationship between the return on the investment and associated costs. Based on the assumption stated under section 2 and primary data collected from the project sites, profitability of sheep fattening for the three study areas with different mode of fattening summarized as follows:

Table 1: Profitability of sheep fattening business with different model of fattening

| Fattening cost and return | External grazing (sheep is left for external grazing and they return to shed only in nights) | | | Semi-Intensive (sheep will spend half the day in open fields and half day in the shed) | | | Zero grazing (sheep are confined to the sheep shed) | | |
|---|--|---------------------|----------------------|--|----------------------|----------------------|---|----------------------|----------------------|
| | Menz | Bonga | Doyogena | Menz | Bonga | Doyogena | Menz | Bonga | Doyogena |
| Variable costs | | | | | | | | | |
| Purchase cost of sheep | 21,000 | 51,250 | 28,000 | 21,000 | 51,250 | 28,000 | 21,000 | 51,250 | 28,000 |
| Feed and/or labor | 11,250 | 15,000 | 11,250 | 5,625 | 5,625 | 5,625 | 11,250 | 11,250 | 11,250 |
| Medication | 1,800 | 1,800 | 1,800 | 1,350 | 1,350 | 1,350 | 900 | 900 | 900 |
| Other miscellaneous costs | 1,125 | 1,500 | 1,125 | 600 | 750 | 675 | 450 | 450 | 450 |
| Number of fattening days | 225 | 300 | 225 | 120 | 150 | 135 | 90 | 90 | 90 |
| Total Variable Cost (TVC) | 35,400 | 69,850 | 42,400 | 28,695 | 59,125 | 35,785 | 33,690 | 63,940 | 40,690 |
| Fixed costs | | | | | | | | | |
| Depreciation cost of shade and equipment (Annual) | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Total fixed costs (TFC) | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Total Costs of Fattening (TVC+TFC) | 37,400 | 71,850 | 44,400 | 30,695 | 61,125 | 37,785 | 35,690 | 65,940 | 42,690 |
| Average selling price of a ram | 2,350 | 4,000 | 3,100 | 2,350 | 4,000 | 3,100 | 2,350 | 4,000 | 3,100 |
| Total revenue (TR) | 47,000 | 80,000 | 62,000 | 47,000 | 80,000 | 62,000 | 47,000 | 80,000 | 62,000 |
| Total Gross Margin (TR-TVC) per a fattening cycle | 11,600 | 10,150 | 19,600 | 18,305 | 20,875 | 26,215 | 13,310 | 16,060 | 21,310 |
| Total Gross Margin per ram (per a fattening cycle) | 580 | 508 | 980 | 915 | 1,044 | 1,311 | 666 | 803 | 1,066 |
| Total Net Income (TR-TVC-TFC) (per a fattening cycle) | 9,600 | 8,150 | 17,600 | 16,305 | 18,875 | 24,215 | 11,310 | 14,060 | 19,310 |
| Net Income per ram (per a fattening cycle) | 480 | 408 | 880 | 815 | 944 | 1,211 | 566 | 703 | 966 |
| Total Net Income (TR-TVC-TFC) per annum) | <u>15,573</u> | <u>9,916</u> | <u>28,551</u> | <u>49,594</u> | <u>45,929</u> | <u>65,470</u> | <u>45,868</u> | <u>57,021</u> | <u>78,313</u> |
| Net Income per ram (per annum) | <u>779</u> | <u>496</u> | <u>1,428</u> | <u>2,480</u> | <u>2,296</u> | <u>3,274</u> | <u>2,293</u> | <u>2,851</u> | <u>3,916</u> |

The study considered three fattening practices for each area. The first one is external grazing, the method which is widely used in most parts of the country and project sites. In this practice, sheep are left for external grazing and they return to shed only in the evenings. There is no feed cost incurred by the farmer/youth group. The major cost for external grazing was labor cost for flock herding. Based on the daily labor cost of each area, a group incurred on average ETB11,250 for Menz area, ETB15,000 for Bonga and ETB 11,250 for Doyogena district. If the group members manage sheep herding, this cost is considered as an opportunity cost which should be included as a cost of the fattening business.

Compared to other production practices, the daily cost of external grazing is low while the fattening cycle is too long which makes the overall cost of labor high per cycle. The average fattening days for external grazing is 300 days (10 month) for Bonga and 225 days (7.5 months) for Menz and Doyogena districts. Even though daily production cost is lower for external grazing, a youth group can fatten only about one cycle per annum or three fattening cycles within two years. With no grazing, rams are ready for the market within 90 days (3 month). The net income of the group per fattening cycle as well as per annum is also very high compared to the external grazing system. Table 1 above shows that, the net income for external grazing per cycle is ETB 9,600, ETB 8,150 and ETB 17,00 for Menz, Bonga and Doyogena district respectively. However, within 90 days with no grazing model, the youth can generate a net income of ETB 11,310, ETB 14,060 and ETB 19,310 in Menz, Bonga and Doyogena district respectively. Although the daily cost of feed per day is relatively higher for no grazing, the group/farmers can fatten their ram within 90 days and undertake the business for four rounds per year.

With 20 sheep per group in the first business year, each group can generate ETB 45,868 in Menz, ETB 57,021 in Bonga and ETB 78,313 in Doyogena. The Annual net income of no grazing practice in Menz and Doyogena is almost threefold the income from external grazing and more than three-fold for Bonga district.

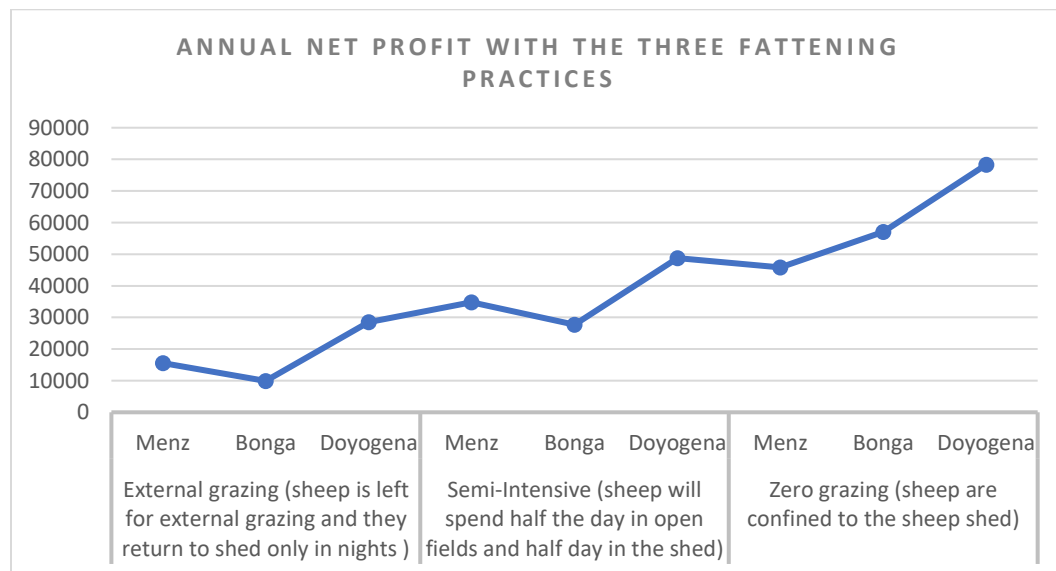


Figure 1: Annual net fattening profit

Figure 1 shows the difference in net annual income of three fattening practices. In areas where the cost of feed and labor is high and there is a shortage of grazing lands, fatteners can use semi-intensive fattening practices. The flock spend half day in open grazing land and use on average 2.5 kg of feed in the shade. With this practice, according to the data from the district, on average fatteners can fatten a sheep 3 cycles per annum in Menz and 2.4 and 2.7 round in Bonga and Doyogena district respectively. The average net income of this practice is about two-fold of the external grazing practices. For example, a group in Menz can generate 34,766 birr per annum in the first operation year with 20 sheep as startup business. In addition to the ETB 34,766 net income, if the group members supply the feed and herd the folk by themselves, the ETB 10,500 considered as feed and labor cost (opportunity cost of members), will also be additional income for the group.

Business growth trend of the group

Based on the first-year profitability of each district under the three-fattening practice, the study also tried to project the profitability of the group for following years. For instance, if each group invests 50% of their annual net income on purchase of additional sheep, projected financial status of a group under different practice and for each district is summarize in Table 2 below.

The result of the analysis shows a significant increase in number of sheep in the second year when they reinvest portion of their income. The net annual income also significantly increases in the second year. The increase in number of sheep, net income and other indicators varies from district to district, among the three fattening practices. Although the net income increased for all fattening practices, the increase for no grazing is much higher than the other practices.

Table 2: Second year financial status of fattening groups

| Second year financial status of youth groups (if they reinvest 50% of their 1 st annual net income on purchase of additional sheep) | External grazing (sheep is left for external grazing and they return to shed only in nights) | | | Semi-Intensive (sheep will spend half the day in open fields and half day in the shed) | | | Zero grazing (sheep are confined to the sheep shed) | | |
|--|--|--------|----------|--|--------|----------|---|--------|----------|
| | Menz | Bonga | Doyogena | Menz | Bonga | Doyogena | Menz | Bonga | Doyogena |
| 50% of annual net income (ETB) | 7,787 | 4,958 | 14,276 | 17,383 | 13,840 | 24,371 | 22,934 | 28,511 | 39,156 |
| Additional no of sheep can be purchased with 50% of net income | 7 | 2 | 10 | 17 | 8 | 17 | 22 | 11 | 28 |
| Total number of sheep on 2 nd year | 27 | 22 | 30 | 37 | 28 | 37 | 42 | 31 | 48 |
| Net Income (per a fattening cycle) on 2 nd year | 17,255 | 9,910 | 32,397 | 24,930 | 15,836 | 38,369 | 26,416 | 23,275 | 49,846 |
| Second year Net Income per ram (per a fattening cycle) | 863 | 495 | 1,620 | 1,246 | 792 | 1,918 | 1,321 | 1,164 | 2,492 |
| Total Net Income (per annum) end of 2 nd year | 27,991 | 12,057 | 52,556 | 75,828 | 38,534 | 103,737 | 107,130 | 94,392 | 202,153 |
| Net Income per ram (per annum) on 2 nd year | 1,400 | 603 | 2,628 | 3,791 | 1,927 | 5,187 | 5,357 | 4,720 | 10,108 |
| Increase in net annual income | 80% | 22% | 84% | 118% | 39% | 113% | 134% | 66% | 158% |

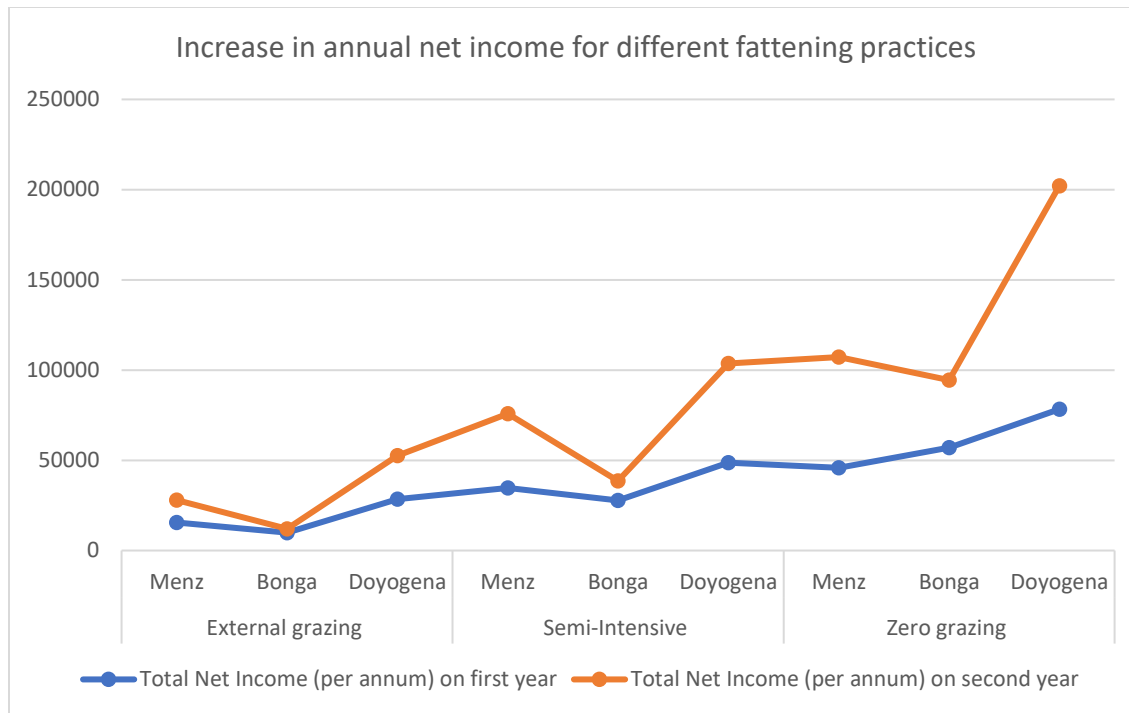


Figure 2: Increase in annual net income for different fattening practices

Figure 2 shows the growth of annual net income in the second year compared to first year for different fattening practices. Even though, there is increase in net income for all practices, there is a significant increase in no grazing practices.

In general, it can be deduced that sheep fattening is profitable in all three districts. Depending on availability of feed, labor cost and grazing land, each group can decide on the fattening practice they should follow. In areas where there is sufficient and inexpensive sheep feed, the study recommends using no grazing practices that would generate better profit. Similarly, if the feed cost is relatively high and there is available grazing land, fatteners can also use semi-intensive practices. Due to long fattening cycle and low return to investment, the extensive grazing practices is the lowest profitable sheep fattening in all three districts.

Constraints in sheep fattening

Sheep productivity is constrained by technical, institutional and socioeconomic factors. Constraints to improved productivity identified are;

- Diseases
- Feed shortage
- Access to market,
- Lack of inputs
- Inadequate veterinary service
- Lack of livestock insurance
- Lack of access to credit.

Feed shortage is one of the limiting factors for increasing productivity of sheep fattening in most of the study area.

Alternative access to market is the most important economic determinant for every business. Sheep markets in most parts of Ethiopia are relatively good with some challenges. Price fluctuation, poor market information, brokers and dominance of local collectors are among the marketing constraints identified in the study area. There is no grading system and regular market information on prices and supplies.

Respiratory diseases, internal and external parasites, foot and mouth disease, pasteurellosis and sheep pox are the most common diseases of sheep in the study areas. Farmers use different vaccination and vet service to manage the diseases.

References

Solomon G, Azage T, Berhanu G and Dirk Hoekstra, 2010. Sheep and goat production and marketing systems in Ethiopia: Characteristics and strategies for improvement. Improving Productivity and Market Success (IPMS) of Ethiopian Farmers Project, International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia.